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THE  
CORNISH FAUNA:

A COMPENDIUM OF THE  
NATURAL HISTORY OF THE COUNTY.

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PART I.  
THE VERTEBRATE ANIMALS,  
AND  
CRUSTACEANS.

BY  
JONATHAN COUCH, F.L.S., &c.  
(SECOND EDITION.)

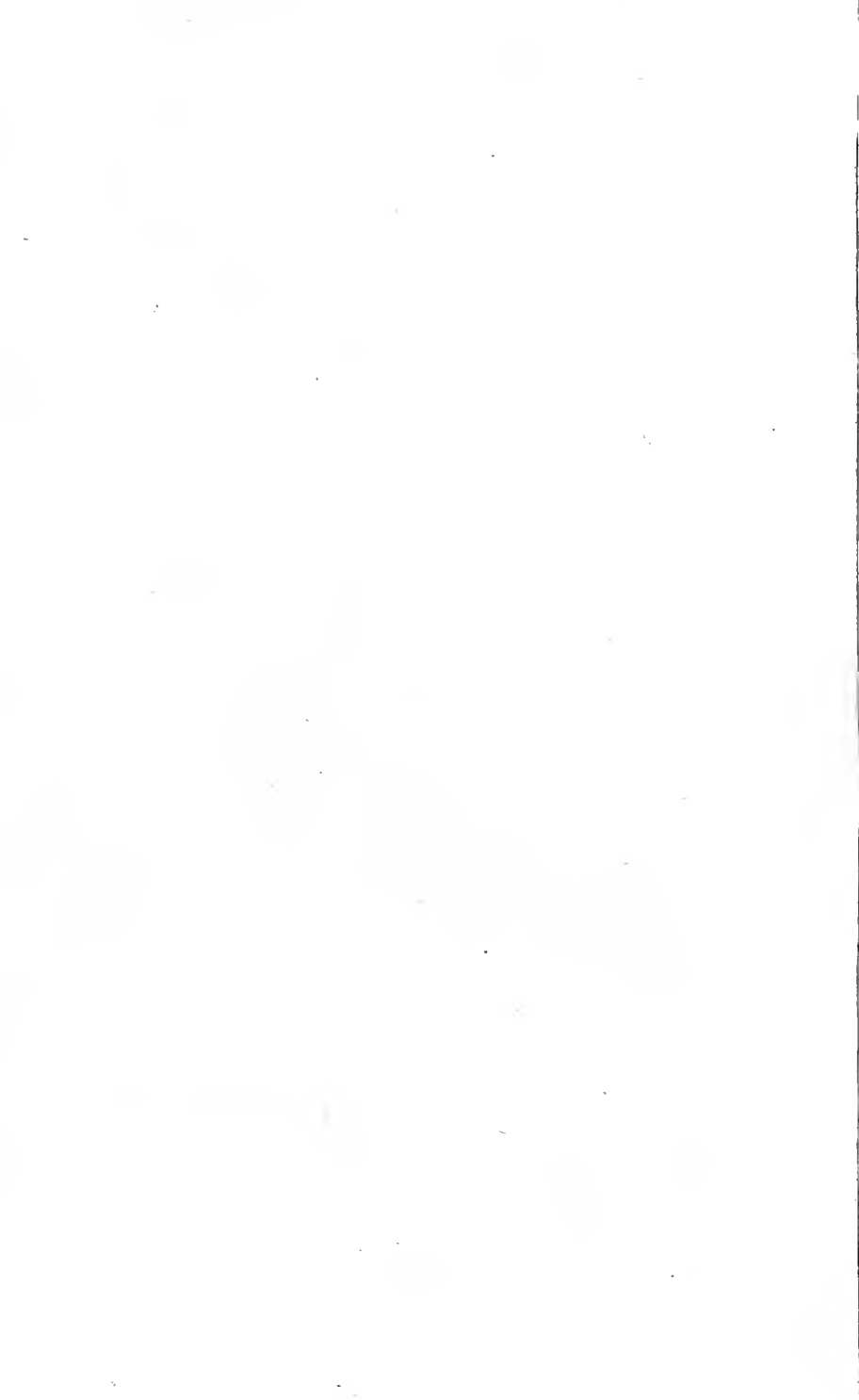
WITH REVISIONS AND LARGE ADDITIONS BY  
J. BROOKING ROWE, F.L.S., (Mammalia); THOMAS CORNISH, (Reptilia and Pisces);  
E. H. RODD, (Aves); and C. SPENCE BATE, F.R.S., (Crustaceans).

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TRURO:  
LAKE & LAKE, PRINCES STREET  
1878.



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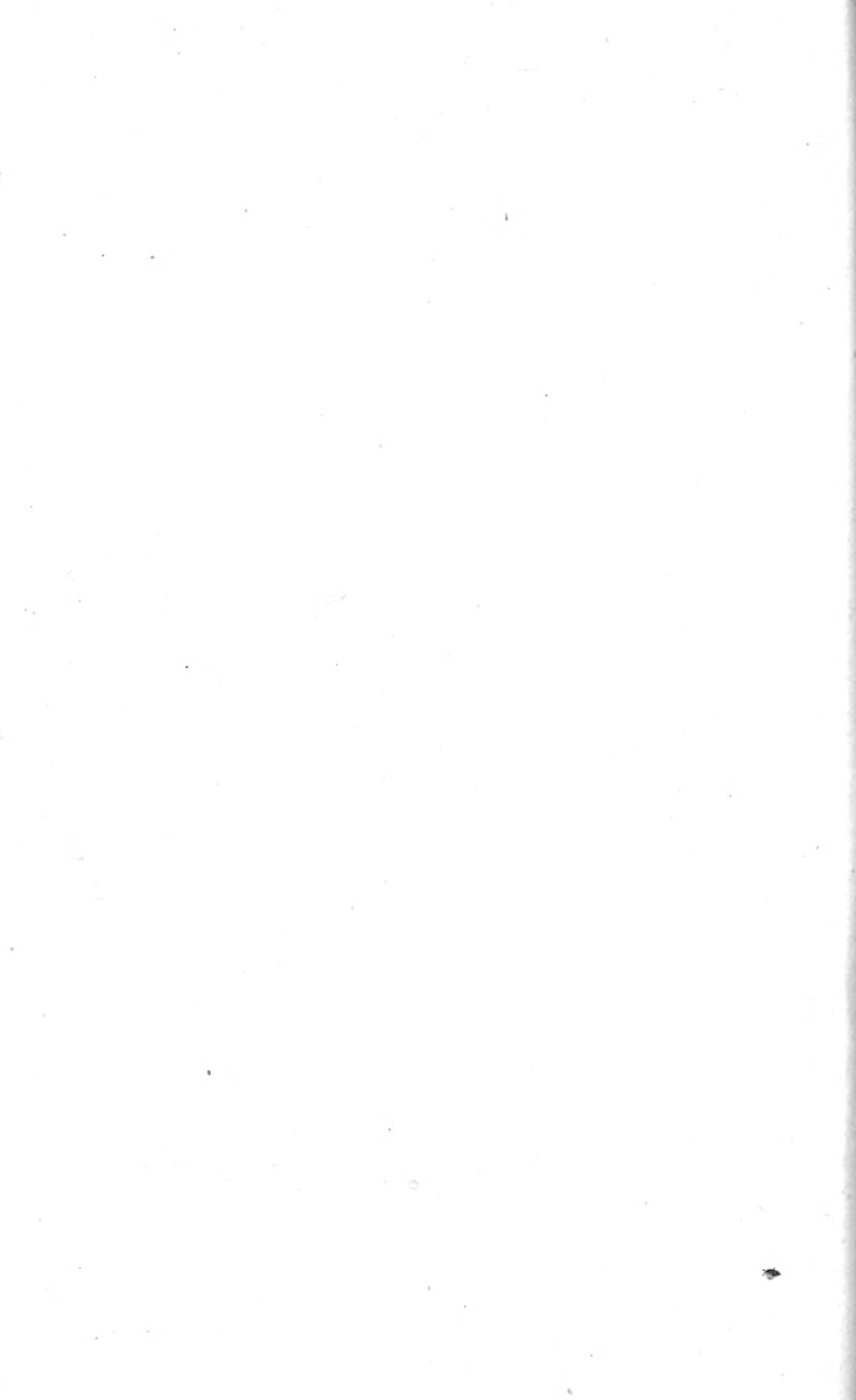




## INTRODUCTORY NOTE.

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Forty years have elapsed since the publication of a "Cornish Fauna," a compendium of the Natural History of Cornwall, and a convenient companion to the Museum of the Institution under whose auspices it was produced. Lapse of time, and a large multiplication of observers have added much to what was then known, and it is gratifying to find that the constant wish of Jonathan Couch is now fulfilled in a much needed second edition of the first part. With such a desire he collected largely, and even went so far as to write the following preface, which was found among his papers, and forwarded to the editor by his son, Mr. T. Q. Couch, of Bodmin. It will be seen that Mr. Couch contemplated adding to the original design, an account of such extinct animals as have had comparatively late entombment in our diluvial soils, gravels, drift, or cavern accumulations, and this still remains a work to be done.



## PREFACE.

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When the first edition of the Cornish Fauna was published, it was judged necessary to make an apology for its production, by offering some explanation of the advantages to be obtained from the study of the natural productions of a limited region towards the progress of science, and the more general understanding of the works of God. But it is highly gratifying to find that such an explanatory apology is now no longer necessary. It is admitted on all hands that such a work is useful. By the scientific naturalist it is confessed that many of his most valuable contributions towards the progress of knowledge have been poured into the common stock from this source; and the local resident has felt a pleasure in discovering that he may become acquainted with the natural objects which surround him, by consulting a book of small size, and which will direct his enquiry after further information, without rendering it necessary for him to wade through a multitude of volumes, without clearly understanding what he is searching for. To every one it must be a matter of interest to possess some amount of information with regard to the number and distribution of the animal creation of his own district; while the men of more general science are also instructed in what has only of late been valued as it deserves, the geographical distribution of living beings on the earth and in the waters. Akin to this is the influence which local circumstances exert on the form and colour or habits of species known to exist also in other lands; and this, with the employments which arise from the visits of fish and birds, as also the opinions and superstitions to which close observation on the one hand, and ignorance on the other, have given rise, are properly the

subject of record in a local work on natural history, although they may with propriety be shut out from books which treat of the science in its wider range.

Whether we regard its geographical position, at the extremity of the kingdom, and surrounded so much by the sea as almost to partake of the character of an island; or whether we take into account the irregularity and diversity of its surface and soil, with the peculiarity of its climate and prevailing winds, there is no county in England that presents such variation of aspect from all besides, as does the county of Cornwall; and as the ocean which surrounds its in general rocky coasts is to be considered as a portion of itself, and the depths of the billows are constantly presenting to the observer some new object of animal life, it will be long indeed, before the curiosity of an inquirer will be satisfied, or the subject can be regarded as exhausted. But here again a local Fauna will be found to hold an important place in the estimation of the student; for it will present to him a summary of the species already known, with their varieties of occurrence, and the circumstances under which they have hitherto been obtained; and as it is important that in such a work as this nothing shall be included that is not well authenticated, and that as much as possible by the writer in his proper person, or from the information of such observers as he can confidently trust, so it should be understood that nothing is introduced into the pages of the work that has already obtained a place in general works of science, unless it shall be indispensable for the purpose of rendering what is essential the more clearly understood, or in order to correct some false opinion of what has been admitted into the general belief.

Besides the general enumeration of the species of animals at present existing in the county, it has been judged proper to insert in this work a notice of some which were formerly found, but have become extinct; and this is done for just the same reason that in writing a history of the nation the subject would not be considered as properly treated, unless it included a notice of the people who at some former time held dominion, although they have long since ceased to exist. Some of these lost animals, as the wolf, the bear, and the wild hog, have disappeared before

the progress of human advancement and industry, as others remain among us only by sufferance, or for our pleasure; but most of the former, have left some marks of their presence, either at least in the names of places where formerly they were found, or in the history of events with which they were connected; and as some of their remains are at times dug up from the places in which they had long been buried, it forms a necessary part of our subject to preserve some record of these fragments in connection with the place, and to associate them in our remembrance with those species which were their companions in ages long gone by, but which from causes altogether unknown have not perished with them.\* We would not deny the ancient existence of many species because they have not left any diluvial remains behind them; but there are undeniable proofs that the badger, among others, which continues to maintain its station among us in spite of persecution, was also an inhabitant of Britain at a time when there roved over our hills a very different race of animals from any we now see, or it would be pleasant or safe to meet.

At the time when the Cornish Fauna of the first edition was written, the number of observers in Cornish natural history was few, and the materials for reference in ascertaining the names of species scanty, but it is a great pleasure to remark that a great improvement has since then taken place in both respects. The series of books on the science, published by Mr. Van Voorst, has left little to be desired in the latter respect; and besides that, they have had, further, the good effect of increasing the number of students of nature, and bringing them into closer acquaintance with others, and thus benefited their enquiries by the mutual aid they have obtained from each other's labours. It is with much pleasure that the author acknowledges the assistance he has received from the communications of several of those, his esteemed friends: the names of whom will be found in the course of the following pages, as authorities for several of the facts he has given, but it is with feelings of sorrow he adds, that some of them, greatly valued, have been removed from all that caused joy or sorrow on earth; and others have been far removed by the casualties of life, either into situations

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\* See Introductory note, p. iii.

in which other cares are made to occupy attention, or into more distant parts of our island or the world, beyond the reach of that once intimate conversation from which at once both pleasure and instruction flowed.

Absent or dead—still let a friend be dear ;  
A sigh the absent claims—the dead a tear.

but in any case it becomes the duty, as it is the gratification of the author, to record the names of those from whom many of his facts have been obtained.

JONATHAN COUCH.

# A CORNISH FAUNA.

BY THE LATE JONATHAN COUCH, F.L.S., &c.

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## VERTEBRATA—MAMMALIA.

*Revised and corrected by J. Brooking Rowe, F.L.S., Fellow of the Society of Antiquaries &c.,*

AT the request of the Council of the Royal Institution of Cornwall, I have revised that part of the Fauna relating to the Mammalia. The author included the Domestic Animals in the original work, but in this edition it has been thought well to omit them, as they are not true members of the Fauna. The parts within inverted commas are in Mr. Couch's own words.

### CHIROPTERA. (BATS.)

"The Cornish name of these animals is Ary-mouse or Rery-mouse, from the Saxon word "ræran" "aræran" to raise or be lifted up, that is to fly."

Since the first edition of the Cornish Fauna was published, much attention has been paid to this interesting order. The investigations of Kuhl, as well as those of Count Keyserling, and Professor Blasius, while productive of much information, have not resulted in confirming the belief, generally entertained some years since, that further research would increase the number of European species. The last edition of Bell's British Quadrupeds has reduced the number of indigeneous species from seventeen to fourteen. Further information will be found in the two editions of Bell's Quadrupeds, Lord Clermont's "Guide to the Quadrupeds and Reptiles of Europe," 1859, and the "Naturgeschichte der Säugethiere Deutschland" of J. H. Blasius, 1857.

### GREAT BAT.—*Vespertilio noctula*.

Jenyns, p. 23; Bell, p. 12, 2nd edition, p. 17; Blasius, p. 53; Clermont, p. 8.

In the county generally, this species may be said to be rare, but in some localities it appears to be frequently met with

especially on the Devonshire border. At Falmouth Mr. Cocks says "not uncommon." With the exception of *V. Murinus* it is our largest British species.

PIPISTRELLE.—*Scotophilus pipistrellus*.

Jenyns, p 24; Bell, p 23, 2nd edition, p 34; Blasius, p 61; Clermont, p 15.

"This is our commonest species, and flies at all seasons of the year if the thermometer be not much below 50°. It awakes in a few hours after the weather has become mild, and is not uncommonly seen abroad in the middle of a fine day." The *V. pygmaeus* of Leach, (Bell, 1st ed., p. 31) is the young or a small individual of this species. Some references by Mr. Couch on the flight of this species in the day-time, are recorded in the Zoologist, 1843, p. 343; and in the same periodical, 1853 and 1854, pp. 3936 and 4157, will be found some interesting observations by him on the habits of some species of bats.

REDDISH-GREY BAT.—*Vespertilio Nattereri*.

Jenyns, p 23; Bell, p 42, 2nd ed., p 54; Blasius, p 88; Clermont, p 10.

Two individuals of this species were obtained by Mr. Couch, from Looe, in Sept., 1852, Zool., 1853, p. 3937. I can find no other instances of the occurrence of this bat in either the peninsula or channel province.

DAUBENTON'S BAT.—*Vespertilio Daubentonii*.

Jenyns, p 26; Bell, pp 45, 47, 2nd ed., p 60; Blasius, p 98; Clermont, p 20.

Mentioned by Mr. Couch as *Vespertilio emarginatus*, Zool., 1853, p. 3942, and Zool., 1854, p. 4157, but without giving the date of capture or the locality. The specimen weighed 79 grains, and the extent of its wings was 10½ ins., a greater expanse than the measurement given by Bell and others. Dr. Bullmore gives three instances of its occurrence in and near Falmouth, and Mr. Cocks says "not uncommon" in the same neighbourhood.

LONG-EARED BAT.—*Plecotus auritus*.

Jenyns, p 27; Bell, p 53, 2nd ed., p 72; Blasius, p 39; Clermont, p 33.  
Common in most places.

BARBASTELLE.—*Barbastellus Daubentonii*.

Jenyns, p 28; Bell, p 63, 2nd ed., p 72; Blasius, p 43; Clermont, p 35.

Rare; found in a cave, west of Mainporth Bay, Mr Cocks. It has been taken in the adjoining county.



GREATER HORSE-SHOE BAT.—*Rhinolophus ferrum-equinum*.

Jenyns, p 19; Bell, p 18, 2nd ed., p 89; Blasius, p 31; Clermont, p 4.

Much rarer in Cornwall than the smaller species next to be mentioned. In Devonshire the reverse is the case.

LESSER HORSE-SHOE BAT.—*Rhinolophus hipposideros*.

Jenyns, p 20; Bell, p 28, 2nd ed., p 96; Blasius, p 29; Clermont, p 4.

Common in some localities. "In the neighbourhood of Tre-lawny house this species abounds, almost to the exclusion of every other." Falmouth, Dr. Bullmore.

## INSECTIVORA. (INSECT EATERS.)

HEDGEHOG.—*Erinaceus Europæus*.

Jenyns, p 19; Bell, p 76, 2nd ed., p 102; Blasius, p 152; Clermont, p 46.

Called in some place in Cornwall the Hedge Boar and Sow. "The female is of a much more timid character than the male, and in captivity has been known to devour her own young." Common.

MOLE.—*Talpa Europæa*.

Jenyns, p 17; Bell, p 85, 2nd ed., p 115; Blasius, p 109; Clermont, p 48.

"In Cornwall generally the Want. Moel, in Welsh, signifies a little hill, and a moel implies a small tumour, but mould also means the earth or soil, and mould-warp, another name of the animal, implies one that bends or works the soil. The Want is one that disappears, as to want is to be absent, to disappear." Common. A mole catcher, in six winter months, took twelve hundred moles in the county.

COMMON SHREW.—*Sorex Vulgaris*.

Jenyns, p 17; Bell, p 109, 2nd ed., p 141; Blasius, p 129; Clermont, p 37. Common.

LESSER SHREW.—*Sorex pygmaeus*.

Bell, 2nd ed., p 148a; Blasius, p 133; Clermont, p 38.

This species, although not hitherto recorded as occurring in Cornwall, will be probably found there, as it is generally distributed throughout the country.

WATER SHREW.—*Sorex fodiens*.

Jenyns, p 18; Bell, p 155, 2nd ed., p 149; Blasius, p 120; Clermont, p 40.

Common. *S. remifer* is a permanent variety of this species.

**CARNIVORA.** (FLESH EATERS.)**BADGER.**—*Meles taxus*.

Jenyns, p 10; Bell, p 122, 2nd ed., p 158; Blasius, p 237; Clermont, p 59.

"The word badger was anciently used as equivalent to tramper or pedler, that is one that walks on his feet, which is applicable especially to this animal, that was placed by Linneus in his Genus *Ursus*, and distinguished from such as walk only on their toes. Ray Syn, p. 185, who gives an account of its structure, omits to mention that its jaw cannot be displaced from the sockets but by breaking the bone, a character not so decidedly found in any other British animal." It is generally common, and in a locality in the neighbourhood of Falmouth, Dr. Bullmore says that it is found in considerable numbers.

**OTTER.**—*Lutra vulgaris*.

Jenyns, p 13; Bell, p 129, 2nd ed., p 167; Blasius, p 237; Clermont, p 59.

"By far the greatest portion of these creatures, in Cornwall, derive their food from the sea, where they may be seen diving for fish even where the waves are very tempestuous. Several instances are known of their being drowned in crab-pots, into which they had entered in search of prey and had not afterwards been able to find the opening." It is common in the many caves around the coast.

**COMMON WEASEL.**—*Mustela vulgaris*.

Jenyns, p 12; Bell, p 141, 2nd ed., p 182; Blasius, p 231; Clermont, p 55.

Common.

**STOAT.**—*Mustela erminea*.

Jenyns, p 13; Bell, p 148, 2nd ed., p 191; Blasius, p 228; Clermont, p 56.

Common.

**POLECAT.**—*Mustela putorius*.

Jenyns, p 11; Bell, p 156, 2nd ed., p 203; Blasius, p 222; Clermont p 53.

Common in some parts.

**MARTEN.**—*Martes foina*.

Jenyns, p 11; Bell, p 167, 2nd ed., p 208; Blasius, p 217; Clermont, p 58.

"Rare and local." I do not know of any recent notices of its capture, and Mr. Couch, writing in 1854, believed it to be no longer an inhabitant of the county. "The last specimen," he says, "I have been informed of, was killed near Liskeard in the first quarter of the present century, and its loss (for it was in ancient times classed with animals of the chase, and its

fur was in high esteem) may be ascribed to the change of habits in society, by which the common use of mineral coal was introduced among farmers. Before that time a large number of pollard trees were permitted to grow in the neighbourhood of *town-places* or farm yards, for the purpose of supplying the house with fuel, and the cavities which most of them contained afforded a safe shelter to these, and the others of the weasel tribe. When such fuel became of less importance these hollow trees were gradually cut down, or suffered to fall, to the great diminution of the numbers of the weasel tribe." Report Royal Cornwall Polytechnic Society, 1854, pp 25, 26.

FOX.—*Vulpes vulgaris*.

Jenyns, p 14; Bell, p 252, 2nd ed., p 225; Blasius, p 191; Clermont, p 62.  
 "Common, especially in cliffs near the sea."

CARNIVORA PINNIPEDIA. (SEALS.)

COMMON SEAL.—*Phoca vitulina*.

Jenyns, p 15; Bell, p 263, 2nd ed., p 240; Blasius, p 248; Clermont, p 73.  
 Not frequently found. Otters are often mistaken for these animals. One Whitsand Bay, 1861.

GREY SEAL.—*Halichærus gryphus*.

Bell, p 278, 2nd ed., p 262; Blasius, p 256; Clermont, p 80.  
 "Mr. Bell's figure and description go far in deciding this to be the species taken in a net near Padstow, in 1832, and of which some account is given in London's Mag. Nat. Hist., Vol. 7, p 208."

RODENTIA. (RODENTS.)

SQUIRREL.—*Sciurus vulgaris*.

Jenyns, p 29; Bell, p 291, 2nd ed., p 276; Blasius, p 272; Clermont, p 116.  
 Common in some parts of the county, rare or unknown in others.

DORMOUSE.—*Myoxus avellanarius*.

Jenyns, p 30; Bell, p 295, 2nd ed., p 281; Blasius, p 297; Clermont, p 122.  
 Frequently called "Dorymouse." Common.

HARVEST MOUSE.—*Mus minutus*.

Jenyns, p 29 ; Bell, p 299, 2nd ed., p 286 ; Blasius, p 326 ; Clermont, p 116.  
Common.

LONG-TAILED FIELD MOUSE.—*Mus sylvaticus*.

Jenyns, p 30 ; Bell, p 305, 2nd ed., p 93 ; Blasius, p 322, Clermont, p 101.  
Common.

COMMON MOUSE.—*Mus musculus*.

Jenyns, p 31 ; Bell, p 308, 2nd ed., p 297 ; Blasius, p 320 ; Clermont, p 100.  
Common.

BLACK RAT.—*Mus rattus*.

Jenyns, p 32 ; Bell, p 311, 2nd ed., p 302 ; Blasius, p 317 ; Clermont, p 98.  
Scarce generally, but occasionally found in some localities.  
Not uncommon at Falmouth.

BROWN RAT.—*Mus decumanus*.

Jenyns, p 32 ; Bell, p 315, 2nd ed., p 308 ; Blasius, p 313 ; Clermont, p 97.  
Common. *M. rattus* and *M. decumanus* are the only British species. *Intermedius* and *domesticus* are apparently slightly varying individuals.

WATER VOLE.—*Arvicola amphibius*.

Jenyns, p 33 ; Bell, p 321, 2nd ed., p 316 ; Blasius, p 344 ; Clermont, p 83.  
Common.

FIELD VOLE.—*Arvicola agrestis*.

Jenyns, p 33 ; Bell, p 325, 2nd ed., p 323 ; Blasius, p 369 ; Clermont, p 90.  
Common.

RED FIELD VOLE.—*Arvicola glareolus*.

Bell, p 330, 2nd ed., 327 ; Blasius, 337 ; Clermont, p 91.

Dr. Bullmore says "not uncommon," and Mr. W. P. Cocks gives two localities, near Falmouth, where it is found.

HARE.—*Lepus timidus*.

Jenyns, p 34 ; Bell, 333, 2nd ed., p 331 ; Blasius, p 412 ; Clermont, p 129.  
Common. "In Loudon's Magazine of Natural History, vol. VII, p 504, there is an account of a white variety of common hare, which, from the year 1829, has continued on Morval estate, the seat of John Buller, Esq., and was still to be found so lately as Christmas, 1836. As several of them have been killed at different times through this series of years, it is clear that the peculiarity has been propagated in the race, whilst their not being found at any considerable distance from their original haunts is a proof of the little disposition evinced to wander from a favourite district."

RABBIT.—*Lepus cuniculus*.

Jenyns, p 35 ; Bell, p 428, 2nd ed., p 343 ; Blasius, p 427 ; Clermont, p 129.

Common. "A black variety is sometimes seen, but this peculiarity is not propagated as in the white hare above mentioned."

## CETACEA MYSTACOCETI.

COMMON RORQUAL.—*Balenoptera musculus*.

Jenyns, p 47 ; Bell, p 520, 2nd ed., p 343 ; Blasius, p 534 ; Clermont, p 160.

"Specimens of the Razor-back are seen upon the Cornish coast every year feeding upon the smaller gregarious fishes. A specimen was cast up at Falmouth, in 1863, and the skeleton is now, or was recently, at the Alexandra Palace, Muswell Hill. Another at Plymouth, in 1831, which had been observed frequenting the Cornish coast in pursuits of herrings for some time previously.

SIBBALD'S RORQUAL.—*Balenoptera sibaldi*.

Bell, 2nd ed., p 402.

"Rare." One at Cadgwith, near the Lizard. It was 65 feet long, 24 inches in circumference, and the breadth of the caudal fin 13 feet. Dr. Bullmore.

BEAKED WHALE.—*Balæna rostrata*.

Bell, 2nd ed., p 411 ; Jenyns, p 47 ; Blasius, p 535.

A specimen brought into Polperro, by the mackerel boats, May, 1850. Dr. Bullmore.

## ODONTOCETI.

SPERM WHALE.—*Physeter macrocephalus*.

Bell, 2nd ed., p 415 ; Blasius, p 532 ; Clermont, 157.

A whale, supposed to be of this species, is sometimes seen off the Cornish coasts, says Mr. Couch, sailing rapidly along at a uniform elevation in the water, with its slender but elevated fin above the surface, while the body is concealed below.

HUMPED BLOWER.—*Physeter polycyphus*.

At to this species I can only quote what is said by Mr. Couch. "I have unfortunately omitted to note the proper reference to any authority for the use of the trivial name here given, and which I had an opportunity of verifying, in a volume belonging to the Library of the Zoological Society of London. One specimen ran itself ashore in pursuit of small fish several years since ; and another was seen and minutely described to me by an intelligent

fisherman, but it would appear that the number of humps on the back is variable. It is probably the *Balæna monstrosa*, Ruysssh's Theat. Anim., vol I. tab 41."

DOLPHIN.—*Delphinus delphis*.

Jenyns, p 40; Bell, p 463, 2nd ed., p 462; Blasius, p 516; Clermont, p 146.

Common. Visits Mount's Bay in large shoals during the summer.

GRAMPUS.—*Delphinus orca*.

Jenyns, p 42; Bell, p 477, 2nd ed., p 445; Blasius, p 522; Clermont, p 150.

Occasionally captured.

PORPOISE.—*Phocæna communis*.

Jenyns, p 41; Bell, p 473, 2nd ed., p Blasius, p 520; Clermont, p 149.

Common. "The sniffer of the Cornish fisherman. It is sometimes caught in drift nets, and I have known it take a bait, though it commonly proves too strong for the line. The rolling motion of this and some other of the smaller species is caused by the situation of the nostrils on the anterior part of the top of the head, to breathe through which the body must be placed in somewhat of an erect posture from which to descend, it passes through a considerable portion of a circle. They rarely congregate into a herd, like the other Delphini, and commonly no more than a pair is seen together."

Risso's GRAMPUS.—*Grampus griseus*.

Bell, 2nd ed., p 450; Blasius, p 523; Clermont, p 152.

A beautiful specimen of this cetacean, an adult female 10 feet 6 inches long, was caught in the mackerel nets, off the Eddystone, 28th Feb., 1870. It is now in the British Museum. See Journal of Anatomy and Physiology, Nov. 1870, and Professor Flower's Memoir, Trans. Zool. Soc., VIII. 1.

PILOT OR CA'ING WHALE.—*Globicephalus melas*.

Jenyns, p 42; Bell, p 483, 2nd ed., p 453; Blasius, p 521; Clermont, p 42.

One or two have been taken, but I have no record of the times or places. One was brought into Plymouth in April, 1839.

[See some notes by Mr. Couch "on the time and manner of the procreation of some species of Whales;" Zoologist, 1845, p 1161.]

## VERTEBRATA—*AVES*.

*Revised and corrected by E. H. Rodd.*

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THE following is a statistical summary of the birds at present included in the Cornish Fauna. It may be remarked that Cornwall and the Land's End locality, including the Scilly Isles, have been singularly fortunate in rendering specimens of our rarer birds, and this may be in a great measure attributed to its extreme westerly position, and other influences which climate and other causes arising from its maritime and peninsular characters are calculated to aid.

### *RAPTORES*. (BIRDS OF PREY.)

Spotted Eagle, *Aquila navia*, Trebartha and Carnanton. One specimen killed at Trebartha in 1861, and another shortly after at Carnanton, both in immature plumage.

White-tailed Eagle, *A. albieilla*, sometimes seen on the sea-coast.

Osprey, *Pandion Haliaetus*, several examples obtained. One example killed at Scilly in Sept., 1849.

Greenland Falcon, *F. Greenlandicus*; very rare in the southern parts of England: one killed at the Lizard, another at Port Eliot, in St. Germans.

Peregrine Falcon, *F. peregrinus*; frequently observed at Scilly, where they breed.

Hobby, *F. subbuteo*; rare: summer visitor.

Red-footed Falcon, *F. rufipes*; rare. Wembury, near Plymouth, within a few miles of Cornwall.

Merlin, *F. Aesalon*; winter visitor: not uncommon. Frequents the outskirts of moors, bordering on cultivated land. The old male with a light blue back is the Stone Falcon of Bewick.

Kestrel, *F. tinnunculus*; generally distributed.

Sparrow-hawk, *A. nisus*; generally distributed: the female of this species is at least one-third larger than the male.

Kite, *Milvus furcatus*; lately obtained from Trebartha. This species has been almost exterminated in the west of England: two examples in the Truro Museum of the Cornish Institution, labelled as Cornish.

Common Buzzard, *Buteo vulgaris*; the most common of the larger *Raptores*. It has been observed that an extensive and regular migration of the common buzzard takes place in the autumn, when large numbers are seen together in the moors in the eastern part of the county, and throughout the county to Scilly.

Rough-legged Buzzard, *B. Lagopus*, Cornish; once seen on Bodmin moors.

Honey Buzzard, *B. apivorus*. The honey buzzard has lately been captured in Cornwall. Two specimens obtained from Carclew, and one from Trereife, near Penzance. This species is remarkable for having the lore covered with small feathers, which in the other *Raptores* is nearly bare.

Marsh Harrier, *Circus rufus*; rare throughout the whole county.

Common Harrier, *C. cyaneus*; not a numerous species: a proportion of 4-5ths of the examples captured have been in the "ringtail" or brown plumage.

Montagu's Harrier, *C. cineraceus*; not rare: observed at Scilly. There are four distinctions in this species from the last: viz.,—its inferiority of size; the black bars on the secondary feathers of the wing of the male; greater length of wing; and in the under parts of the adult male having longitudinal rufous streaks, whilst the immature males and females have the under parts of an uniform rufous brown, characters not observable in the common harrier.

Scops-eared Owl, *Scops Aldrovandi*, Trevethoe and Scilly Isles.

Long-eared Owl, *Otus vulgaris*; commonly distributed.

Short-eared Owl, *O. brachyotus*; common winter visitant.

White Owl, *Strix flammea*; rather rare in the western part of Cornwall, but more numerous in the eastern part.

Tawny Owl, *Syrnium aluco*; generally distributed.

Hawk Owl, *S. funera*. The first recorded British example of this owl was taken on board a collier, a few miles off the coast of Cornwall, in March, 1830, in an exhausted state.

Little Owl, *Noctua passerina*; rare: one obtained near Helston, and in the collection of the late Mr. Magor, of Redruth.



## INSESSORES. (PERCHERS.)

Great Grey Shrike, *Lanius excubitor*; rare: occasional visitant in some parts of England, and generally, though not always, in the winter. One killed at Gweek, near Helston.

Lesser Grey Shrike or Rose-breasted Shrike, *Lanius minor*, Cornish; Scilly Isles. A specimen of this Shrike was killed at Scilly in the month of November 1851. (See Corr. and notices in "Zoologist" for the year 1867. See also further particulars of this new British species in Gould's "Birds of Great Britain," Article *L. minor*.)

Red-backed Shrike, *L. collurio*; summer visitant, not numerous, and at uncertain intervals; nest large for the size of the bird, and much exposed.

Woodchat Shrike, *L. Rufus*; very rare: an adult bird caught in a boat, near Scilly. In the autumn of 1849 several examples of the young of the year were captured on the Scilly Isles.

Spotted Flycatcher, *Muscicapa grisola*; generally distributed.

Pied Flycatcher, *M. luctuosa*; not recorded as a Cornish species till the autumn of 1849, when one was captured at Alverton, Penzance; others have since been taken at Scilly.

Red-breasted Flycatcher, *M. parva*; Carwythenack, Constantine, and Scilly. (See Gould's "Birds of Europe.")

Common Dipper, *Cinclus aquaticus*; East Cornwall: frequents rocky mountain streams.

Missel Thrush, *Turdus viscivorus*; generally distributed.

White's Thrush, *T. Whitei*. A specimen of this rare thrush, in very perfect plumage, was killed near Trewithen, in Probus, a short time since.

Fieldfare, *T. pilaris*; winter visitant: after severe frost there is always a great accession of numbers throughout this and the western counties, from their retreating as far southward and westward as possible for a less rigorous climate; a short duration of severe frost appears to prostrate the powers of this and the following species.

Redwing, *T. iliaca*, Cornish; winter visitant. (See previous remarks on the fieldfare.)

Song Thrush, *T. musica*; generally distributed.

Blackbird, *T. vulgaris*; generally distributed.

Ring Ouzle, *T. torquato*; summer visitant. More common on the eastern moors, where they breed.

Golden Oriole, *Oriolus galbula*; not uncommon in the spring months, and observed nearly every year at Scilly.

Hedge Sparrow, *Accentor modularis*; generally distributed.

Redbreast, *Erythaca ruticilla*; generally distributed.

Redstart, *Phenicura ruticilla*; very rare westward of Exeter.

At Trebartha woods, in the parish of North-hill, nest and eggs were also found and secured, and specimens of the bird.

Seen during the autumnal migration. at Scilly.

Black Redstart, *P. Tithys*; not uncommon in the winter months in immature plumage. Observed at Scilly.

Stonechat, *Saxicola rubicola*; generally distributed.

Whinchat, *S. rubetra*; rare and local; eastern moors; occasionally in the neighbourhood of Penzance.

Wheatear, *S. ænanthe*; summer visitant.

Grasshopper Warbler, *Salicaria locustella*; summer visitant; rare.

Sedge Warbler, *S. phragmites*; summer visitant.

Reed Warbler, *S. arundinacea*; several captured at Scilly, with other summer migrants, in the autumn of 1849.

Blackcap Warbler, *Curruca atricapilla*; local; summer visitant. Song sweet, wild, and full.

Garden Warbler, *C. hortensis*, Cornish; summer visitant; eastern part of the county. Its habits, food, song, nest and eggs, and general character, approach very near the former species:—song rather more hurried, and sometimes garulous in expression, but the quality of voice quite equal, and the tones deeper, some of its notes resembling the blackbird's song.

Whitethroat, *C. cinerea*; summer visitant: commonly distributed.

Lesser Whitethroat, *C. garrula*; occasionally seen at Scilly.

Wood Warbler, *Sylvia sibilatrix*; summer visitant: common in several localities in the eastern parts of the county, viz.—Trebartha Woods, where it breeds annually: only once seen in the western district. This bird possesses two varieties of song, quite different from each other: the first, and the most usual, is the rapid jarring trill, from which it derives its Latin name; the second is a low whining, plaintive call, repeated two or three times, at uncertain intervals, resembling the words "chea," "chea," "chea."

Willow Warbler, *S. trochilus*; summer visitant; rather local.

Chiff-chaff, *S. rufa*; summer visitant: generally distributed. Some few remain throughout most winters, and have been heard chirping, in mild, open weather, in December and January.

Dartford Warbler, *Melizophilus provincialis*; much more common than formerly.

Gold-crested Regulus, *R. cristatus*; generally distributed.

Fire-crested Regulus, *R. ignicapillus*; not uncommon; Penzance, Gwennap, &c.

Great Tit, *Parus major*; generally distributed.

Blue Tit, *P. cæruleus*; generally distributed.

Cole Tit, *P. ater*; not uncommon in woods.

Marsh Tit, *P. palustris*; not uncommon, and not confined to marshes.

Long-tailed Tit, *P. caudatus*; rather local: found in small families throughout the winter.

Bearded Tit, *Calamophilus biarmicus*; very rare.

Bohemian Waxwing, *Bombycilla garrula*; occasional winter visitant.

Pied Wagtail, *Motacilla yarrellii*; generally distributed.

Continental Pied Wagtail, *M. alba*; not uncommon in the spring months.

Grey Wagtail, *M. boarula*; winter visitant in the south of England: generally distributed. Some few remain throughout the summer in Cornwall, and breed.

Grey-headed Wagtail, *M. neglecta*; rare: Marazion Green.

Ray's Wagtail, *M. flava*; seen for a few days on their first arrival, and again in the autumn, on their return.

Tree Pipit, *Anthus arboreus*; summer visitant: very common in the eastern parts of the county, in the summer months: rare in west Cornwall. Song louder and very superior in quality to the titlark.

Meadow Pipit, *A. pratensis*; generally distributed.

Rock Pipit, *A. aquaticus*; generally distributed on our rocky beaches.

Tawny Pipit, *A. campestris*; Scilly Isles.

Richards' Pipit, *A. Richardi*; (length  $7\frac{1}{2}$ , not  $6\frac{3}{4}$ , ins.: see Yarrell), Cornish; rare.

Sky Lark, *A. arvensis*; generally distributed.

Crested Lark, *A. cristata*. The discovery of this species in this district took place at about the period of the publication of the 1st supplemental number to Yarrell's History of Birds, the bird not having been recognized as British at the time of the publication of his work.

Wood Lark, *A. arborca*; local.

Short-toed Lark, *A. brachydactyla*; very rare; a specimen shot at Scilly on September 23rd, 1854.

Snow Bunting, *Emberiza nivalis*; not uncommon in the autumn months.

Common Bunting, *E. miliaria*; generally distributed.

Black-headed Bunting, *E. schæniculus*; not uncommon in marshes where bushes grow.

Yellow Bunting, *E. citrinella*; generally distributed in every hedge-row.

Cirl Bunting, *E. cirrus*; not uncommon.

Ortolan Bunting, *E. hortulana*; very rare: one specimen was killed on a wall at Trescoe Abbey, Scilly, in 1851.

Chaffinch, *Fringilla cælebs*; generally distributed.

Mountain Finch, *F. montifringilla*; winter visitant in severe weather.

Tree Sparrow, *F. montana*; very rare.

House Sparrow, *F. domestica*; generally distributed.

Greenfinch, *F. chloris*; generally distributed.

Hawfinch, *Coccothraustes vulgaris*; winter visitant: appears singly, and sometimes in small flocks, at uncertain intervals.

Goldfinch, *Carduelis elegans*; rather locally distributed.

Siskin, *Fringilla spinus*; winter visitant.

Common Linnet, *Linaria linota*; universally distributed.

Lesser Redpolo, *L. minor*; very rare throughout the county.

Mountain Linnet, *L. montana*; rare.

Bullfinch, *Pyrrhula vulgaris*; locally distributed and nowhere numerous.

Common Crossbill, *Loxia curvirostra*; rare: seen at distant and uncertain intervals in small flocks.

White-winged Crossbill, *L. bi-fasciata*; rare: an adult bird killed at Larrigan, near Penzance, some years since.

Common Starling, *Sturnus vulgaris*; Cornish: universally distributed in the winter months, in flocks; rare in summer.

- Rose-coloured Pastor, *Pastor roseus* ; several examples have been obtained in Cornwall, and an adult bird from Scilly.
- Chough, *Corvus graculus* ; much less common than formerly ; sparingly observed in different localities on the coast.
- Raven, *C. corax* ; generally distributed.
- Carrion Crow, *C. carone* ; generally distributed.
- Hooded Crow, *C. cornix* ; rare : occasional visitant. Formerly abundant on Marazion Green, whence it derived one of its synonyms of "Market-Jew Crow "
- Rook, *C. frugilegus* ; generally distributed.
- Jackdaw, *C. monedula* ; generally distributed.
- Magpie, *C. pica* ; generally distributed.
- Jay, *C. glandarius* ; common in the woodland districts of the county.
- Green Woodpecker, *P. viridis* ; very common in the eastern woodlands, and more frequent than formerly in the west of Cornwall.
- Great spotted Woodpecker, *P. major* ; rare : seen in the eastern woodlands.
- Lesser Spotted Woodpecker, *P. minor* ; rare. The note of this bird exactly resembles the roosting call of the common blackbird.
- Wryneck, *Yunx torquilla* ; rare in all parts of the county : occasionally observed in the neighbourhood of Penzance in the autumn only, near the coast, probably preparing for migration. Some specimens obtained at Scilly, with other migratorial birds, in the autumn.
- Common Creeper, *Certhia familiaris* ; commonly distributed where large trees grow.
- Wren, *Troglodytes vulgaris* ; Cornish ; generally distributed.
- Hoopoe, *Upupa epops* ; examples of this bird are generally to be obtained every spring.
- Nuthatch, *Sitta Europea* ; very common in the eastern woodlands, becoming more rare westward.
- Cuckoo, *Cuculus canorus* ; generally distributed in the summer months.
- Yellow-billed American Cuckoo ; on the authority of the notice in Yarrell's work, a very rare British bird.
- Roller, *Coracias garrula* ; two or three captured near the Land's End.

Bee-eater, *Merops apiaster*. The only instances of the occurrence of this bird in this county was the capture of a flock of twelve near Helston, in 1828, and which came into the possession of the late George Borlase, Esq., of that place; and, on the authority of Mr. Couch, of Polperro, four specimens were seen in the parish of Madron.

Kingfisher, *Alcedo hispidus*; generally observed on the sea-coast; nowhere common, but generally observed, from its attractive metallic colours.

Swallow, *Hirundo rustica*; summer visitant: universally distributed.

Martin, *H. urbica*; summer visitant: universally distributed.

Sand Martin, *H. riparia*; summer visitant: generally distributed in the neighbourhood of, and within reach of sandbanks.

Common Swift, *Cypselus apus*; locally distributed.

Alpine Swift, *C. Alpinus*; very rare: one example taken near the Lizard, and afterwards preserved by Mr. Jackson, of Looe. One specimen of the Alpine swift in adult plumage was captured in the parish of Mylor, in the summer of 1859.

Nightjar, *Caprimulgus Europæus*; locally distributed.

#### RASORES.

Ring Dove, *Columba palumbus*; generally distributed.

Stock Dove, *C. œnas*; rare in the western counties: two specimens obtained from Scilly a few years since.

Rock Dove, *C. livia*; found occasionally in the cliffs on the south coast of Cornwall, about Looe and Polperro.

Turtle Dove, *C. turtur*; summer visitant: generally observed in more or less numbers, in the spring months, in sheltered valleys.

Black Grouse, *Tetrao tetrix*; very rare in Cornwall: occasionally seen in the eastern moors.

Pallas's Sand Grouse, *Syrrhaptes paradoxus*. The general distribution of a flight of this oriental species (which has hitherto only been noticed in the great sand deserts in western Asia, and in the eastern portions of Europe) over the whole of the British Isles, from John o'Groat's house to the Land's End and the Scilly Isles, and from Norfolk to Ireland, during the summer of 1863, entitles it to be ranked amongst the British wild birds. Some specimens showed eggs in the

ovarium more or less developed, and one female in particular from the naked state of the breast and belly gave strong evidence of incubation. (See "Zoologist" for 1863.)

Partridge, *Perdix cinerea*; universally distributed.

Common Quail, *C. vulgaris*; rare.

Great Bustard, *Otis tarda*; one observed and afterwards captured on Goonhilly, Lizard district: this proved to be a female. Another example of the great Bustard was obtained from the immediate neighbourhood of St. Austell, near Polgooth mine, in the month of January, 1854.

Little Bustard, *O. Tetrax*; rare: two specimens (females) of the little Bustard were brought to Penzance and sold to the poulterers in December, 1853.

Great Plover, *Edicnemus crepitans*; occasionally observed in the Land's-end district in the winter months, and one or more examples captured every year.

Golden Plover, *Charadrius plumialis*; generally distributed in the winter months.

Dottrell, *C. morinellus*; rare: open moors and sheepwalks; an inland species.

Ringed Plover, *C. hiaticula*; Cornish; generally distributed along our sea-shores.

Kentish Plover, *C. Cantianus*; a specimen obtained from Marazion beach.

Little Ringed Plover, *C. minor*; very rare as a British bird. A young bird of the year, corresponding in every particular with the figure in Gould's "Birds of Europe," was shot near the higher pond of Tresco, Scilly, in October, 1863.

Grey Plover, *Squatarola cinerea*; occasional winter visitant, especially after severe weather.

Lapwing, *Vanellus cristatus*; locally distributed.

Turnstone, *Streptilas interpres*; observed in the spring and autumn migrations.

Sanderling, *Calidris arenaria*; not a very numerous species: specimens in winter and summer plumage frequently obtained.

Oyster-catcher, *Hematopus ostralegus*; not uncommon on the western coast of Cornwall and at Scilly.

- Common Heron, *Ardea cinerea*; generally distributed in suitable localities, especially in creeks and estuaries. There is a Heronry on the Lamorran river, near Truro; another near Fowey.
- Purple Heron, *A. purpurea*; two adult examples in perfect plumage obtained in the county within the last few years.
- Squacco Heron, *A. comata*; occasional visitant in the spring months.
- Little Bittern, *A. minuta*; very rare: a specimen was lately obtained from St. Hilary and Scilly.
- Common Bittern, *Botaurus stellaris*; not uncommon at uncertain periods.
- Night Heron, *Nycticorax Europæus*; occasionally met with and specimens obtained from East and West Cornwall.
- White Stork, *Ciconia alba*, Cornish; very rare: only one recorded instance, and that at the Land's-end, in May, 1848.
- Black Stork, *C. nigra*; very rare: a specimen killed either on the Tamar or Lynher, in 1831.
- White Spoonbill, *Platalea leucorodia*; occasionally, and especially of late years, observed in various parts of the county, and at Scilly.
- Glossy Ibis, *Ibis falcinellus*. On September 19th, 1854, the glossy ibis was shot at Tresco, Scilly.
- Common Curlew, *Numenius arquata*; common on the sea-coast, and in harbours, creeks, and estuaries.
- Wimbrel, or May Bird, *N. phaeopus*; observed in the latter part of April, and again in the autumn, in going to and returning from their northern breeding-grounds. When disturbed their note resembles the words "huddle, huddle, huddle, huddle," quickly uttered.
- Spotted Redshank, *Totanus fuscus*; rare: occasionally met with in the autumn months.
- Common Redshank, *T. calidris*; not uncommon on salt marshes.
- Bartram's Sandpiper, *T. Bartramii*. A specimen of *T. Bartramii* was shot at or near Goonhilly, in the week of the 6th of November, 1865.
- Green Sandpiper, *T. ochropus*.
- Yellow-shanked Sandpiper, *T. flavipes*; one specimen shot on Marazion Marsh.



Wood Sandpiper, *T. glareola*; not uncommon in the autumn, and sometimes in the spring months.

Common Sandpiper, *T. hypoleucos*; summer visitant.

Greenshank, *T. glottis*; not uncommonly met with in the same localities as the redshank. This bird shews the connecting link between the sandpiper and the godwits, in the form of the beak, which turns a little upwards.

Avocet, *Recurvirostra avocetta*; very rare as a Cornish bird: one obtained from the Land's-end, apparently a bird of the year, in September, 1847.

Black-tailed Godwit, *Limosa melanura*; occasional visitant.

Bar-tailed Godwit, *L. rufa*; generally to be met with in the autumnal months on flat sands and estuaries. In summer the breast of this species is bright bay, in winter white; the breast of the bird of the year, until the next summer, buff.

Ruff, *Machetes pugnax*; occasionally met with in the autumnal months only in the marshes in the Land's-end district.

Woodcock, *Scolopax rusticola*; winter visitor: universally distributed.

Great Snipe, *S. major*; very rare generally in the western counties.

Common Snipe, *S. gallinago*; universally distributed in suitable localities: a brown variety, with the dorsal stripes narrower, occasionally met with.

Jack Snipe, *S. Gallinula*; as universally distributed as the last-named species.

Sabine's Snipe, *S. Sabini*. This variety of the common snipe, as it is supposed to be by some, and doubted by others, was killed near Carnanton, in the neighbourhood of St. Columb, in January, 1862; also at Madron recently.

Brown Snipe, *Macrorhampus griseus*; very rare as a British bird, five or six examples only having occurred: one reputed to have been killed in Devon. Very common on the shores of America. The first and only example of this rare species in Cornwall (a bird of the year) occurred at Scilly, on the 3rd of October, 1857.

Curlew Tringa, *Tringa subarquata*; common in the autumnal months along our flat beaches.

Knot, *T. canutus*; a few observed on most of our flat beaches in the autumnal and spring seasons: in summer plumage the breast is bright red, in winter, white.

Buff-breasted Tringa, *T. rufescens*; very rare—two examples only recorded of its capture in Cornwall, one between Penzance and Marazion; the other on high ground near Chûn Castle, Morvah.

Little Stint Tringa, *T. minuta*; occasionally seen, and specimens obtained from salt marshes near the sea.

Temminck's Stint Tringa, *T. Temminckii*; found occasionally in the same localities as the last-named species, but not so frequently.

American Stint, *T. pusilla*. An example killed in Marazion marsh, October 10th, 1854.—This is the first recorded British specimen, killed by Mr. W. H. Vingoe.

Schinz's Tringa, *T. Schinzii*; two specimens killed on Hayle estuary, in Oct., 1846.

Pectoral Tringa, *T. pectoralis*. I quote the words of Mr. Yarrell in reference to the capture of this interesting species in Cornwall:—

"D. W. Mitchell, Esq., of Penzance, sent me in June, 1840, a coloured drawing of the natural size, and a fully detailed description with measurements, of a sandpiper, shot by himself on the 27th of the previous month, while the bird was resting on some sea-weed within a few yards of the water on the rocky shore of Annet, one of the uninhabited islands of Seilly.—On the following day another example was seen, but became so wild after an unsuccessful shot that it took off to another island and escaped altogether.—The close accordance of the specimen obtained with the description of *Tringa pectoralis* in summer plumage in the 4th part of M. Temminck's *Manual*, led Mr. Mitchell to a true conclusion as to the species and its novelty and interest in this country."

Several obtained since from Seilly.

Dunlin Tringa, *T. variabilis*; generally distributed on all our flat beaches throughout the year.

Purple Tringa, *T. Maritima*; not unfrequently seen on the rocks extending into the sea, both in the spring and winter.

Collared Pratincole, *Glareola torquata*; very rare as a British bird. The Lizard.

Land Rail, *Gallinula crex*; locally distributed over the east and west of Cornwall.

Spotted Crake, *G. porzana*; occasional winter visitant.

Little Crake, *G. minuta*. This is a rare British bird, and although no recorded Cornish example exists, Mr. Drew, naturalist, late of Plymouth, had a specimen which he said he received from the neighbourhood.

Baillon's Crake, *Crex Baillonii*; a rare British species: one specimen obtained from the basin of Penzance pier, another from Zennor, and a third from Marazion marsh in 1877.

Moor-hen, *Gallinula chloropus*. The remarks on the water-rail apply to this species.

Water Rail, *Rallus aquaticus*; generally met with in suitable localities.

Common Coot, *Fulica atra*; common in marsh pools, &c.

Grey Phalarope, *Phalaropus lobatus*; occasional visitant, and often in large numbers, in the autumnal and winter months, but at uncertain intervals.

Red-necked Phalarope, *Lobipes hypoboreus*; occasional visitant, found inland near fresh water.

#### NATATOIRES.—(SWIMMERS.)

Grey Lag Goose, *Anser ferus*. A specimen was shot in Marazion marsh in the early part of March, 1862.

Bean Goose, *A. segetum*; this is our common wild goose.

White-fronted Wild Goose, *A. albifrons*; not unfrequently obtained at the Land's-end in the winter months.

Bernicle Goose, *A. bernicla*; occasionally obtained from the Land's End marshes.

Brent Goose, *A. brenta*; occasional visitant, and in considerable flocks in hard winters.

Spur-winged Goose, *A. gambensis*; the only recorded British specimen was killed near St. Germans, in June, 1821, and, in a mutilated state, was given by Mr. Henry Mewburn of that place.

Hooper, or Wild Swan, *Cygnus ferus*; the hooper is generally observed in the western counties after a long continuance of hard frost.

Bewick's Swan, *C. Bewickii*. This species was so long confounded with the former, as a small variety, that I have ventured to record it as Cornish.

Mute Swan, *C. olor*; only known as domesticated.

Common Shieldrake, *T. vulpanser*; not uncommon in severe winters.

Shoveller, *Spathulea clypeata*; not uncommon in severe winters.

Wild Duck, *Anas boschas*; universally distributed.

- Gadwall, *Cauliodus strepera*; rare: one specimen, and the only one recorded from this neighbourhood.
- Pintail Duck, *Querquedula acuta*; common in the Land's-end district in severe weather.
- Garganey, *Q. cireia*; a spring visitor in Cornwall: a few summers since several were obtained in the neighbourhood of Penzance in very beautiful plumage.
- Teal, *Q. crecca*; the most regular of our duck visitors every winter, appearing sometimes early in the autumn.
- Wigeon, *Marca Penelope*; a regular visitor to the Land's-end district.
- Eider Duck, *Somateria mollissima*; one specimen killed on the river Looe: rarely seen in southern latitudes.
- Velvet Scoter, *Oidemia fusca*; sometimes seen in Mount's-bay, and one shot at Penzance quay.
- Common Scoter, *O. Nigra*; rare: occasionally seen in Mount's-bay and captured. All the scoters are oceanic in their habits, and are more frequently seen at sea than inland.
- Surf Scoter, *O. perspicillata*; a rare bird in England, and only occasionally seen in the north of Scotland. A specimen of this duck in adult plumage was picked up in a dying state on the beach at St. Mary's, Scilly, on the 22nd September; the autumnal moult was completed and the plumage yet black,—the white on the top and back of the head, pure white,—the colour of the anterior portion of the bill, Seville-orange-yellow,—nail, greyish-yellow.
- Pochard, *F. ferina*; not uncommon in the winter months after frost.
- Scaup Duck, *F. marila*; rare in the western districts, a few occurring in severe weather: the female has a broad white patch at the base of the bill.
- Tufted Duck, *F. cristata*; found in the Land's-end district in all winters with more or less frost.
- Long-tailed Duck, *Harelda glacialis*; very rarely found in the southern counties of England: a female killed on Marazion marsh a few years since, and at Tregothnan.
- Golden Eye, *C. vulgaris*; not an uncommon species in hard winters in the Land's-end district.

- Smew, *Mergus albellus*; rare: a few instances of its occurrence on record.
- Red-breasted Merganser, *M. serrator*; generally a winter visitor.
- Goosander, *M. merganser*; sometimes observed in Mount's-bay, but only in winter plumage: the adult male has the breast of a beautiful glowing maroon buff colour.
- Great Crested Grebe, *Podiceps cristatus*; not uncommon in winter on marshes.
- Red-necked Grebe, *P. rubricollis*; quite as often occurring as the last-named species,—frequenting the same localities.
- Horned Grebe, *P. cornutus*; specimens not in adult plumage occasionally obtained from the Land's-end district.
- Eared Grebe, *P. auritus*; specimens not unfrequently obtained, but generally in immature plumage: a specimen in adult summer plumage obtained some years since from St. Just pool, Falmouth harbour, and now in the Truro museum.
- Little Grebe, *P. minor*; the most commonly distributed of all the grebes in the Land's-end district. In summer plumage the neck is dark-red with the chin black.
- Great Northern Diver, *Colymbus glacialis*; found in more or less numbers every year, generally in immature plumage, and in the autumnal months; though of late years some specimens in the adult state have been killed.
- Black-throated Diver, *C. arcticus*; more rare than the former species, sometimes seen in Mount's-bay.
- Red-throated Diver, *C. septentrionalis*; common in the autumnal and winter months in Mount's Bay, and at this season invariably found without the red throat, and in the plumage represented by Bewick as the "speckled diver."
- Common Guillemot, *Uria troile*; frequently seen singly, and in small parties, in Mount's-bay, and around our coast.
- Ringed Guillemot, *U. lacrymans*; the specific distinction of this bird from the common guillemot is doubted.
- Black Guillemot, *U. grylle*; rare on the western coasts of Cornwall: one example, in intermediate plumage, taken some years since in Mount's-bay.
- Little Auk, *Mergulus melanoleucos*; not frequently met with on our coasts.

- Puffin, *Alca fratercula*; occasionally observed on the Land's-end cliffs, but the precipitous rocks on some of the islands at Scilly appear to be its favourite haunts.
- Razor Bill, *A. torda*; a common species.
- Common Cormorant, *Phalacrocorax carbo*; generally distributed throughout the western coast of Cornwall.
- Common Shag, *P. cristatus*; more numerous as a species than the last-named, and more frequently observed in creeks and arms of the sea.
- Gannet, *Sula bassana*; not unfrequently observed, and sometimes in small companies, in Mount's-bay and on the north coast.
- Sandwich Tern, *S. cantiaea*; a few pairs observed in the summer months on some of the islands at Scilly.
- Roseate Tern, *S. Dougalli*; formerly abundant in summer at Scilly: breeds on Annet, a Scilly rock, and some other localities near.
- Common Tern, *S. hirundo*; more or less common in the summer in Mount's-bay, approaching nearer the shore in windy weather: less abundant at Scilly than the roseate or arctic terns.
- Arctic Tern, *S. Arctica*; a common species in summer both on our coast and at Scilly, at which latter locality its eggs may be obtained every year.
- Whiskered Tern, *S. leucopareia*; an immature specimen obtained in the month of September, 1851, at Scilly.
- Gull-billed Tern, *S. Anglica*; a few examples only have been captured in England. In the latter part of May or beginning of June, 1852, an adult specimen was shot at Scilly.
- Lesser Tern, *S. minuta*; several examples of this small tern have been obtained close by the town of Penzance.
- Black Tern, *S. nigra*; generally observed in the autumnal months, and nearly every year, in more or less numbers, on the sea-side and island.
- Sabine's Gull, *Larus Sabini*; rare: occasionally obtained in winter in its immature plumage. This bird has been mistaken for the little gull, but in its young state it may be known by the absence of black in the wing, by the greater length and slenderness of the beak, and by the tail being *deeply forked*.

- Little Gull, *L. minutus*; rarely met with, but specimens in adult and immature plumage have been obtained at Penzance and the Land's-end,—the latter in the month of December, 1844.
- Black-headed Gull, *L. ridibundus*; not uncommon on the sands at Hayle and elsewhere, in winter.
- Kittiwake Gull, *L. tridactylus*; common on our coasts generally.
- Ivory Gull, *L. eburneus*; very rare: the only recorded example of this bird in Cornwall was captured off the pier at Penzance, in the month of February, 1847.
- Common Gull, *L. canus*; generally distributed in more or less numbers along our coasts.
- Bonapartian Gull, *L. Bon* (See Yarrell's 2nd "Supplement," p. 55); an immature specimen killed in Falmouth harbour, in June, 1865.
- Lesser Black-backed Gull, *L. fuscus*; generally distributed, with the herring gulls, in large numbers on our flat sands and open estuaries.
- Herring Gull, *L. argentatus*; the most common gull on our coast, and generally distributed in estuaries, creeks, open sands, and precipitous cliffs.
- Great Black-backed Gull, *L. marinus*; one or two may be seen, at all times and seasons, in different localities along our coast.
- Glaucus Gull, *L. glaucus*; occasionally observed, but by no means regularly or frequently.
- Iceland Gull, *L. islandicus*; rare. A specimen of the Iceland gull in the state of plumage almost amounting to pure-white, obtained from Scilly.
- Common Skua, *Lestris catarractes*; rarely met with in the western counties: observed at the Wolf rock in considerable numbers in 1863.
- Pomerine Skua, *S. pomarinus*; occasionally, and at uncertain intervals, occurring on our coast, and in every instance in immature plumage.
- Richardson's Skua, *L. Richardsonii*; rarely observed on our coast, and more rarely in adult plumage.
- Buffon's Skua, *L. parasiticus*; very rare: a specimen found inland in the parish of St. Buryan, in adult plumage.



Greater Shearwater, *Puffinus major*; occasionally seen, and specimens obtained from Mount's-bay.

Manx Shearwater, *P. anglorum*; common at Scilly, where it annually breeds in rabbit-holes.

Fulmar Petrel, *Procellaria glacialis*; very rarely observed in the south of England: one specimen taken alive at the Land's-end.

Wilson's Petrel, *P. Wilsonii*; one specimen only obtained from Cornwall, and this was found dead in a field near Polperro; it passed into the hands of Mr. Couch, who forwarded it to Mr. Yarrell, whose figure of this bird was taken from the Cornish specimen.

Fork-tailed Petrel, *P. Leachii*; several specimens of this small petrel have from time to time been obtained on our coasts.

Storm Petrel, *P. pelagica*; of frequent occurrence in the summer months, and observed at a distance of five or six miles at sea. Abundant at Scilly, where they breed. Egg white, with a rufous zone at the larger end.

## APPENDIX.

From the year 1843 to the present time much attention has been given to the Natural History of the Isles of Scilly: valuable contributions have been given in our Geological and Natural History Reports on the geology of the islands, and on the botanical, entomological, and other natural productions of this western archipelago, and a large amount of statistical information as to the specimens recorded has appeared in the pages of the "Zoologist" since the above period. The following list of the occurrences and captures of some of our rarer and more interesting British species of birds in these islands (most of our common way-side birds being found there) may, it is hoped, keep alive an interest in the natural history of this district, remembering that from the peculiar westerly and southerly position of the group, there always exist chances of stragglers being found there under disturbed states of the elements, or as a favourable resting-place in the great northern and southern migratorial movements of birds, as the following list will show.



The following is a list of some of the rarer and more interesting species of British birds observed and captured at Scilly.

Pectoral Sandpiper, *Tringa pectoralis*.—Isle of Annet, Scilly ..... May 29th, 1840.

Ring Dottrel, *Charadrius hiaticula*.—Breeds. . . April 25th, 1843.

Hoopoe, *Upupa epops*.—At different times since 1843, to present time.

Scops Owl, *Strix Aldrovandi*,—The grey figure of this owl in Gould's "Birds of Great Britain" is a male bird, and drawn from this specimen. .... April, 1847.

Night Heron, *Ardea nycticorax* ..... May, 1849.

Osprey, *Pandion haliaetus* ..... May, 1849.

Pied Flycatcher, <i>Muscicapa luctuosa</i> .	} September, 1849, during autumnal migration,—apparently in transitu only, as they are not found in Cornwall in the spring.
Reed Wren, <i>Salicaria arundinacea</i> .	
Woodchat Shrike, <i>Lanius rufus</i> ..	
Garden Warble, <i>Curruca hortensis</i> .	
Wryneck, <i>Yunx torquilla</i> .....	

Spoonbill, *Platalea leucorodia*..... June, 1850.

Ortolan Bunting, *Emberiza hortulana* ..... October, 1851.

Little Stint, <i>Tringa minuta</i> .....	} September, 1851.
Whiskered Tern, <i>Sterna leucoporeia</i> .....	

Lesser Grey or Rose-breasted Shrike, *Lanius minor* (the first British specimen) ..... November, 1871.  
(See Gould's "Birds of Great Britain.")

Fire-crested Wren, <i>Regulus ignicapillus</i> ....	} October, 1851.
Richard's Pipit, <i>Anthus Richardi</i> .....	

Montague's Harrier, *Circus cineraceus*.—Three specimens; one with a thrush's egg in its mouth ..... April, 1852.

Gull-billed Tern, <i>Sterna Anglica</i> .....	} May, 1852.
Iceland Gull, <i>Larus islandicus</i> .....	

Goosander, *Mergus serrator* ..... December, 1853.

- Short-toed Lark, *Alauda brachydactyla* .... } September, 1854.  
 Glossy Ibis, *Ibis falcinellus* ..... }
- Schinz's Sandpiper, *Tringa Schinzii* ..... }  
 Hawfinch, *Loxia coccythraustes* ..... } October, 1854.  
 White-fronted Goose, *Anser albifrons* .... }
- Pied Flycatcher, (young), see *ante* .... September, 1857.
- Lesser Whitethroat, *Curruca garrula* ..... }  
 Landrail, *Gallinula crex* ..... } October, 1857.  
 Brownsnipe, *Macroramphus griscus* ..... }  
 Temminck's Stint, *Tringa Temminckii* .... }
- Long-eared Owl, *Otus vulgaris* .. }  
 Short-eared Owl, *O. brachyotus* .. } Every year.
- Merlin, *Falco Æsalon* ..... }  
 Purple Sandpiper, *Tringa maritima* ..... } December, 1859.  
 Cirl Bunting, *Emberiza cirrus* ..... }  
 Bramble Finch, *Fringilla montifringilla* .... }
- Red Phalarope, *Phalaropus hyperbora* .... }  
 Brent Goose, *Anas Brenta* ..... } October, 1860.
- Golden Oriole, *Oriolus galbula* (first recorded).. June, 1861.
- Pallas's Sand Grouse, *Syrhaptes paradoxus*.... June, 1863.
- Marsh Harrier, *Circus rufus* ..... }  
 Red-Breasted Flycatcher, *Muscicapa parva* .. } October, 1863.  
 Little Ringed Plover, *Charadrius minor* .... }
- Long-tailed Duck, *Anas glacialis* ..... November, 1864.  
 Sparrow Hawk, *Accipiter nisus*.—Occasionally.
- Chiff Chaff, *Sylvia Rufa* ..... December, 1864.
- Redstart, *Phenicura rutila*. }  
 Blackstart, *P. Tithys*. } Observed generally every autumn.
- Golden Oriole, *Oriolus galbula* (in several states }  
 of plumage for some weeks) ..... } May, 1865.

Grey Plover	..	} Periodical migrants, varying, according to circumstances, in numbers and time of appearance.
Little Grebe	....	
Chaffinch	..	
Linnet	....	
Green Linnet	..	
Blackbird	....	
Thrush	..	
Fieldfare	....	
Redwing	..	
Starling	....	
Peewit	..	
Golden Plover	..	
Larks	....	
Missel Thrush	..	
Goldfinch	....	

## VERTEBRATA—REPTILIA & AMPHIBIA.

*Revised by Thos. Cornish.*

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I HAVE revised Mr. Couch's list of Cornish reptiles after having revised his list of Cornish fishes, and therefore I must beg leave to refer to the remarks with which I preface that list for an explanation of my process now.

### REPTILIA—(REPTILES).

“Luth” or “Leathery Turtle” (*Sphargis Coriacea*). Borlase records the occurrence of this turtle in Cornish seas, and there is no reason to doubt the correctness of his observation. Certainly several have been taken on the coast of France, and some on the coast of England. It is a powerful swimmer.\*

“Green Turtle” (*Chelonia viridis*.) The turtle which yields the green fat of turtle soup, A specimen, covered with barnacles and sea weed, was taken alive and in vigorous condition, in a drift net about two miles south of Mousehole Island, in Mount's Bay, on 5th October, 1874. This turtle sometimes appears in English waters, washed overboard from ships or out of a wreck, but it is probable that this particular specimen found its way across the ocean naturally (by coming with the current) not only from the state in which it was when taken, but also from the fact that within four days of its capture “pimelepteres cornubiensis,” a tropical fish, was taken alive in Mount's Bay, out of a floating packing case, which was covered with barnacles. The fish and the turtle probably floated across the Atlantic together in some sort of involuntary company.

The Sand Lizard (*Lacerta agilis*) is mentioned by Borlase, and retained by Couch as having occurred in Cornwall. They

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\* Couch (appendix p. 149) records the capture of a turtle off “the Wolf” Rock, but its species was not identified. It was taken in August, 1839.

are probably correct, but I myself have never seen it west of Dartmoor.

The Viviparous or Scaly Lizard (*Zootoca vivipara*) is not uncommon. These are the only two lizards known to be natives of England.

The Slow-worm (*Anguis fragilis*). The Blind Worm. Very common.

The Snake (*Tropidonotus natrix*.) The common snake. By no means uncommon, but local in its habitat. Couch says of it that "it has been found six feet in length," but this must be a mistake. There is no record of the occurrence of an English snake of more than four feet in length, and a specimen which exceeds three feet is unusual. This snake takes readily to water, in which it swims partly submerged with its head erect.

Viper (*Pelias Berus*) adder, long-cripple. The only British reptile capable of causing a poisoned wound; common in some localities. Never attains the size of the common snake at its largest. Can swim as the snake does, but does not take to water voluntarily. "Red Viper" may be considered abandoned as a distinct species. The story that the viper swallows its young to protect them from danger may be regarded as mythical.

Newt. Two species only are admitted as English by the authorities of the British museum. The crested newt (*Triton vulgaris*), and the smooth newt (*Lophinus vulgaris*.) The other dissimilar newts are treated as mere accidental varieties. The crested newt and its consort are entirely aquatic. The smooth newt is in my experience more often found on land than in water. Both species occur in Cornwall and correspond, the "triton palustris" of Couch to the "triton vulgaris" and the "Triton punctatus" of Couch to the "lophinus vulgaris." These little lizards are called by very many names "asker," "evat," "eft," and even "salamander" can be heard of them in Cornwall. The newts are easily tamed and very playful. The "crested newt" derives its name from the fact that the male develops in the breeding season a membraneous crest, which it is without during the rest of the year.

Frog (*Rana temporaria*). The common frog. In its young form after leaving its tadpole stage, it is known as "Quilkin."  
Toad (*Bufo vulgaris*.) Common and perfectly harmless. Can make itself stink disagreeably, but that is all.

I do not think that the edible frog (mentioned by Mr. Couch in the "Fauna") can be maintained as belonging to Cornwall.

But I consider that the common land tortoise (*Testudo græca*), having bred in Cornwall, is as much entitled to admission into the Fauna of Cornwall as any other import which has proved permanent (say for instance, perch, carp, gold fish, or even horses, or canaries).

## VERTEBRATA.—PISCES.

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*Corrected and Revised by Thomas Cornish*

SINCE the late Mr. Jonathan Couch wrote on the fishes of Cornwall in his "Cornish Fauna," thirty nine years have elapsed. Within that period Yarrell has published an Appendix to each of his two volumes; Couch himself has published his "British Fishes;" "The Zoologist" has been an open record of all the new observations on British Fishes, and last (and least) I have had myself the pleasure of maintaining a constant correspondence on Ichthyology with Mr. Couch during the last twelve years of his life, and whilst I was yet in leading strings as a naturalist I enjoyed the great advantage of a close personal friendship with the well-skilled son of a well-skilled father, the late Mr. R. Q. Couch, of Penzance. Of course in the lapse of so many years many new fishes have been observed in our Cornish seas, and many observations on old ones have been corrected, and therefore with the advantages of which I boast I approach the revision of Mr. Couch's list of fishes with less diffidence than I should otherwise have felt.

His work must stand. It is a perfectly accurate record of the state of ichthyological knowledge in 1838, and in revising it I propose to leave out a good deal of information which was very interesting then but has been since superseded; and I hope to add some details of more active interest at the present time.

For the sake of preserving as much similarity in the two lists as is possible I propose to follow the classification adopted by Mr. Couch, but as he is now himself a greater authority than the author (Jenyns) whom he most frequently quotes, and whose work is now but rarely to be met with, I shall substitute his own work ("Couch's British Fishes," 1st ed., 1862-1865) for that of the older writer. This course will be attended by the further advantage that in making Couch's British Fishes the book on which I work I can shorten my list by the omission of all reference to it. Whoever wishes to learn the full history of any fish

named has but to refer to the index in the fourth volume of the book, and he will there find out where to read of it.

There is one difficulty connected with the detailing of a list of British fishes observed in Cornwall to which I must call attention. Of course we score everything as of Cornwall which we actually catch on the Cornish coast, and if a specimen occurs in Plymouth harbour (as of the hippocampus) we may fairly claim it as occurring in the Cornish seas, but we frequently obtain rare specimens from the stomach of a cod (which fish some one has wittily termed the "naturalists' purveyor,") or rare fish are taken in the Bristol channel (surely a Cornish sea), off the Welsh coast, or are landed by some captain of a ship who has procured them on his voyage home (as for instance, "Remora" from the Bay of Biscay), or they are taken by our driving boats many leagues south and west of the Scilly islands. Are these specimens Cornish fish? They present themselves in our museums, and on the whole I am inclined to give them rank as Cornish fishes. We are, I think, entitled from our promontorial position to regard as our own all fish which come within the sweep of our fishermen, or of vessels landing them in fresh condition on our shores.

#### *PERCIDÆ*.—(THE PERCH KIND).

Perch. (*Perca Fluviatilis*). A freshwater fish; not an aborigine of Cornwall, but naturalised in many ponds.

Basse. (*Labrax Lupus*). Common in harbours, in sandy bays, and on a lee shore in rough weather. Weighs on an average 8lbs.

Smooth Serranus. (*Serranus Cabrilla*). Comber. West of the Lizard it is known as the "Loe fish;" not uncommon; usually dies with its mouth wide open.

Dusky Serranus (*Serranus gigas*). Dusky perch. A mediterranean fish of very rare occurrence.

Stone Basse (*Serranus Couchii*). The term "stone basse" is applied in Cornwall to at least three distinct fish. This fish is not a basse at all, but a serranus. The only known specimen of it was observed by Mr. Couch, and it worthily bears his name. It is also known as "Couch's Polyprion."

Squirrel fish. (*Hamulon Formosum*). Mr. Couch in his Fauna says "It is a native of the West Indies. One specimen has



been taken at Looe," but he does not record it in his "British Fishes," nor does Yarrell mention it. It is probable therefore that Mr. Couch concluded his record of it was doubtful.

Dentex. (*Dentex vulgaris*). Four-toothed sparus. Has been observed twice off Falmouth.

Mendole. (*Sparus mena*). The Cackarel. A Mediterranean fish recorded as having once occurred at Falmouth.

The Red Mullet. (*Mullus Surmuletus*). The striped red mullet, "The woodcock of the sea." Very common. Has been taken in Mount's Bay of the weight of 39½ oz.

Plain Red Mullet. (*Mullus Barbatus*). Mr. Couch mentions this fish as Cornish, but I believe when he wrote there was a confusion between plain red mullet and one of the gurnards (*Mullus Imberbis*). I do not think that the occurrence of *Mullus Barbatus* in Cornwall is anywhere recorded.

The Weever. (*Trachinus Draco*). The Sting Bull. The Poison fish. The Canker. Very good eating, but its first dorsal contains a poison bag at the base of the rays, which had better be cut out before the fish is cooked. The fish is able by means of these dorsal rays to inflict a poisoned wound, which causes swelling and much pain as far as the elbow joint. It is common in some sands, but is never found in rocky grounds.

Lesser Weever. (*Trachinus Vipera*). Shorter and deeper than the last-named, much more rare. Found occasionally at Hayle and at Pra Sands in Breage.

### TRIGLIDÆ.—(GURNARDS).

Elleck. (*Trigla Cuculus*). Red Gurnard. Red fish. Soldier. Halleck. Common off every coast.

Tub. (*T. Hirundo*). Sapphirine Gurnard. Common.

Piper. (*T. Lyra*). Stated by Mr. Couch in the Fauna to be common, but it certainly is not so in West Cornwall.

Streaked Gurnard. (*Mullus imberbis*). The Rock Gurnard. The French Gurnard. The Parson. Formerly confounded with plain red mullet (which see). Not uncommon on shoal rocky ground.

Grey Gurnard. (*T. Gurnardus*). The Gurnard. Very common.

- Bloch's Gurnard. (*T. Blochii*). Distinguished from Elleck by its blunt profile and dark colour. By no means uncommon.
- Lanthorn Gurnard. (*T. Lucerna*). The Long-finned Captain. Recorded as having occurred once at Plymouth. Very rare.
- Little Gurnard. (*T. Pæcilopectera*). A very small fish. Very rare. Has been taken at Falmouth and in the Bristol Channel.
- Armed Gurnard. (*Peristedron malarum*). Mailed Gurnard. Very rare.
- Pogge. (*Aspidophorus cataphractus*). Armed Bullhead. Sea Poacher. Black sting fish. Mentioned by Couch as not uncommon. I have never seen a specimen.
- Miller's Thumb. (*Cottus Gobio*). River Bullhead. A freshwater fish. Common.
- Fatherlasher. (*Cottus Scorpius*). Sea Scorpion. Sting fish (but it does not sting. It is so called from the complete spine armament of its head.) Found inshore. Common.
- Lucky Proach. (*Cottus Bubalis*). Also called Fatherlasher. Common in deep water with rocky bottom.
- Three-spined Stickleback. (*Gasterosteus Spinulosus*). Banstickle. Pricklefish. Mr. Couch says of it "It is not uncommon, though not in abundance. It ascends our rivers in May." My experience of it is that it is a very common fish, and a permanent resident in our small brooks, where it is frequently mistaken for (and called) the minnow.
- Fifteen-spined Stickleback. (*G. Spinachia*). Sea Adder. Often confounded with the Pipe fishes. Common.
- The half-armed Stickleback and the Smoothtailed Stickleback are abandoned by Couch in his "British Fishes."
- Couch here introduces the Maigre (*Sciaena Aquila*), which is not a stickleback, but the typical fish of the Sciaenidae, an allied family. It is a Mediterranean fish, and has occurred in Cornwall on several occasions in sizes varying from one foot to over five feet in length. The largest specimen recorded was literally drowned off the Land's End. A large stem of oroweed had got entangled in its gills, and the fish being thus prevented from breathing, died from suffocation.

## SPARIDÆ.—(SEA BREAMS).

Black Bream. (*Cantharus Griseus*). Old wife. Stone basse. Common in some localities (off Rinsey and Trewavas Heads in Mount's Bay for instance), but usually rare. An excellent fish for the table.

Bogue. (*Boops vulgaris*). Box. Ox-eye. Rare.

Becker. (*Pagrus vulgaris*). Braise. Not common, and when occurring frequently confounded with common bream. An excellent table fish.

Couch's Sea Bream. (*Pagellus Rondeletii*). Only a single specimen is recorded.

Spanish Bream. (*P. Erythrinus*). Couch in "British Fishes," distinguishes this from Erythrinus (so called by him as its English name), but I am confident that the differences between the two fish are only those caused by size and accidental circumstances.

Bream. (*P. centrodonatus*). When half-grown, "Ploser." When young, "Chad." Common everywhere.

Short Sea-Bream. (*P. Curtus*). Distinguished by Couch in his British Fishes but only one specimen is recorded.

Gilthead. (*Chrysophrys Aurata*). Rare. Last recorded occurrence off Land's End, 1st March, 1870.

Couch here follows with:—

Rays Bream (*Brama Ravi*), which is not a Bream at all, but one of the scalerayed (*squammipennes*) family. Natives usually of the tropics. This fish has occurred several times, but always, thus far, in an exhausted state, wave-beaten on a beach.

On 9th October, 1874, a specimen of another scalerayed fish occurred alive in Mount's Bay. It was identified as one of the Family Pimelepterus (Cuvier), and named *P. Cornubiensis*. It also is tropical, and has no English name. It is described in Zoologist, 2nd series, No. 111, p. 4255, December, 1874.

## SCOMBERIDÆ.—(THE MACKAREL TRIBE).

Mackarel. (*Scomber scombrus*). Common. Having taken the opportunity of a voyage from the Scilly Islands in the busy part of the mackarel season of 1874, to inspect over 15000,

\* There were over 60,000 mackerel on board, but 45,000 were packed in "pads" before we started.

mackerel, I can say with confidence that the fish described in British Fishes as "dotted" and "scribbled" mackerel are accidental varieties.\*

Spanish Mackerel. (*Scomber maculatus*). I am very doubtful also whether this is a distinct species. Its variation from the typical fish does not appear to me to be sufficient to distinguish it.

Tunny. (*Thynnus vulgaris*). Not uncommon as a spring and summer visitor, but not often taken.

Bonito. (*Scomber pelamis*). Same.

Germon. (*Orcynus alalunga*). Longfinned Tunny. Very rare.

Pelamid. (*Pelamis sarda*). Belted Bonito. I take this to be a fish known to mackerel fishermen as the albacore, and if so it is common in spring and summer.

Plain Bonito. (*Auxis vulgaris*). Rare. A specimen has been recently (1877) taken in Mount's Bay.

Shortfinned Tunny. (*Thynnus brachypterus*). Very rare.

Pilot Fish. (*Naucrates ductor*). Not an uncommon visitor. Frequently follows vessels into our harbours.

John Dorée. (*Zeus faber*). Common.

Blackfish. (*Centrolophus pompilus*; *Coryphæna pompilus*). Rare.

Has been usually taken in company with a shark or some other large fish.

Cornish Centropholus. (*C. Britannicus*). A specimen was thrown on shore near Looe in February, 1859.

Ausonia Cuvieri. A single specimen was taken at Falmouth in 1866. It is supposed to have occurred twice only in British seas.

Opah. (*Lampris Luna*). This beautiful fish is but rarely seen.

Scad. (*Trachurus vulgaris*). Horse mackerel. Common.

Derbio. (*Centronotus binotatus*). A Mediterranean species, of which one example occurred in Mount's Bay, in 1857.

Boar fish. (*Zeus aper*). Very common near the Rundle-stone and Wolf Rocks. In 1875 large shoals were thrown on shore at Scilly in a gale of wind. It has also occurred singly at Scilly and Whitesand Bay in Sennen. Elsewhere it is rare.

Sword fish. (*Xiphias gladius*). Occurs commonly, but is rarely taken.

*TÆNLÆDÆ*.—(SCABBARD FISHES).

The Scabbard fish. (*Lepidopus Argyreus*). Rare.

Silvery Hairtail. (*Trichiurus lepturus*). Not uncommon of late years. Remarkable for its barbed teeth and enormous gape. Couch (see British Fishes, vol. II, p. 63) was apparently misled as to this latter fact by having seen only specimens which had been dead for some time, and which were consequently stiff.

Banks Oarfish. (*Regalecus Banksii*). Hawkins' Gymnetrus. Occurred at Newlyn in Mount's Bay once, at some date between 23 February, 1788 and 1796. The confusion has arisen from the existence of several copies of a sketch of it, bearing different dates, but which are evidently copies of one original. There is a trace, but not a record, of its occurrence once subsequently at Marazion. This is the "Ceil Conin," and the "King of the Herrings."

Red Bandfish. (*Cepola rubescens*). Red Snakefish. Couch (Fauna) speaks of it as "not uncommon." I have heard of its capture, on competent authority, off the coast of Cornwall, but I have never seen a specimen, and curiously enough Couch, though (British Fishes) he speaks of it as common in the south and west of England, does not record a capture of it in Cornish waters.

*MUGILIDÆ*.—(THE MULLET).

Grey Mullet. (*Mugil capito*). Common. The object of large fisheries in many parts of Cornwall.

Lesser Grey Mullet. (*Mugil chelo*). Thicklipped grey mullet. Rare.

Atherine. (*Atherina presbyter*). Sand Smelt. A frequent visitor in autumn in large shoals. It takes a bait readily and is excellent eating. It is said never to frequent waters in which the smelt (*Osmerus eperlanus*) is to be found.

Boiers' Atherine. (*Atherina Boieri*). Large shoals of this rare fish occurred at Polperro in 1846.

Longfinned grey mullet. (*Mugil Auratus*). Golden mullet. A specimen was captured in Mount's Bay about 1865.

Trumpet fish. (*Centriscus scolopax*). Bellows fish. Has been recorded as having occurred three times in Cornwall.

*Gobioidæ*.—(THE BLENNIES).

The Gattorugine. (*Blennius Gattorugine*). The Tompot. Common.

The Butterfly Blenny. (*Blennius ocellaris*). Not uncommon near Falmouth, but elsewhere it is rare.

The Shanny. (*B. pholis*). The Bully or Bullcod, dear to the youth of our sea-coasts. The smooth Blenny. Common everywhere. Voluntarily spends a large portion of its time out of water in the crevices of the rocks, and can, by the aid of two false pectorals and its tail direct its motions when on shore.

Montague's Blenny. (*B. Montagu*). Not uncommon.

Yarrell's Blenny. (*Blenniops Ascarii*). Not uncommon in Cornwall, but rare in West Cornwall.

Butterfish. (*Gunnellus vulgaris*). Nine eyes. Spotted gunnel. Common. Traditionally said to have derived its name of Gunnel from the ignorance in common of the naturalist who first observed it, and of a fisherman to whom he showed it. The fisherman said "it looked very much like a gunnel" (meaning the gunwale of a small boat), and the naturalist assumed that the fisherman knew the fish, and had called it by its proper name. Couch (see "Fauna") alludes to this.

The Wolf-fish. (*Anarchichas lupus*). The Catfish. Very rare.

The Rock Goby. (*Gobius niger*). The black goby, also called Miller's thumb. Common.

The Paganellus. (*G. Paganellus*). A Mediterranean species. Rare in this country, but recorded as having occurred in Cornwall.

The two-spotted Goby. (*G. bipunctatus*). Is recorded as having occurred in Cornwall, but it is not common.

The Broadfinned Goby (*G. biocellatus*) and the Tail spotted Goby (*G. attenuatus*) are distinguished from *G. bipunctatus*, and from each other, by Couch, but it seems to me that they are thus distinguished on insufficient grounds. In very little fish like these the accidental variations are out of all proportion numerous to those of large fish. Take for instance the white goby, admitted by Yarrell as *G. albus*, and by Gunther as *Latrunculus albus*. Couch sweeps it away at once

as the "young of some better known species." Nothing but aquariums can settle these questions for us.

The Yellow Skulpin. (*Callionymus lyra*). The Gemmeous dragonet. This very handsome fish is now recognised as the adult male, whilst the dusky skulpin or sordid dragonet (*C. dracunculus*) is the adult female or immature young of the same fish. It is heavily armed with a jagged spine at the lower back angle of the operculum. Though small, its flesh is excellent. Not uncommon.

The Angler. (*Lophius piscatorius*). The fishing frog. The Devil fish. Common.

Couch abandons the small winged angler and the long angler.

#### LABRIDÆ.—(THE WRASSES).

(Pronounced, in the singular, Ráa). I follow Mr. Couch (see "Fauna") in giving the Wrasses with great reservation. He speaks of the confusion from which they were only "emerging" when he wrote in 1838, but I, having had unusual opportunities of examining the family, (having, for several years for a holiday month outright, caught never less than a dozen a day, of all sorts of wrasse) am at present inclined to a belief that the Labridæ are not of so many species as the books say, and that the confusion which Mr. Couch noticed in 1838 is by no means at an end.

Ballan Wrasse. (*Labrus maculatus*). The "Johnráa" of the country people. Very common. With this one, must go, in my opinion, the greenstreaked wrasse (*L. lineatus*) as its female or immature young. Couch (Fauna) apparently at one time favoured this view, although he retains the green wrasse in his larger work.

The Comber. (*L. Comber*). This wrasse is rare if it is a distinct species, but I incline to think it an accidental variation of the young Ballan wrasse.

The Blue striped wrasse. (*L. coquus*). Male; takes with it as its female the three-spotted wrasse (*L. trimaculatus*), and together are a beautiful pair of fish, and not at all uncommon.

The Scalerayed Wrasse (*Acantholabrus Couchii*) is admitted by Yarrell and by Couch, but is so rare, and its peculiarity of being scale-rayed is so un-English, that I am unwilling to rank it as a Cornish wrasse, although it may well be a scale-



- rayed visitor from the tropics of some other species, just as were Ray's bream and *Pimelepterus Cornubiensis*.
- Rock cook. (*Acantholabrus exoletus*). Small mouthed wrasse. Common and well defined, but I am by no means certain that it is not *L. maculatus* or *L. coquus* in its young form.
- Corkwing. (*Crenilabrus Cornubicus*). Gold finny. Very common, but as Couch says, "the Corkwing like others of its family varies in its colours.
- Jago's Goldsinny. (*Crenilabrus rupestris*), Cuvier). Common, but it is frequently a matter of great difficulty to say when a specimen is corkwing and when goldsinny.
- Rainbow Wrasse (*Julis vulgaris*) has occurred once only. In Mount's Bay.
- Two-spotted Wrasse (see "Fauna") is probably another name for the three-spotted wrasse. See Yarrell, Vol. I, p. 286, ed. 1836, where he gives the synonym of "Doubly-spotted wrasse" to *L. trimaculatus*. Hog wrasse is abandoned by Couch in British Fishes.

I think I have said enough to show that the classification of the Labridæ is in a most unsatisfactory condition, and requires the close attention of ichthyologists.

#### CYPRINIDÆ.—(THE CARPS).

- The Carp. (*Cyprinus carpio*). A pond fish throughout Cornwall.
- The Gudgeon (*Gobio fluviatilis*) said by Couch (British Fishes) to have been introduced of late into Cornwall, and to be thriving "in some ponds near Penzance," but I do not know of it.
- The Tench. (*Tinca vulgaris*). A common pond fish.
- Gold-fish. (*Cyprinus auratus*). A pond fish, of course not aboriginal. But it breeds in ponds.
- Dace. (*Leuciscus vulgaris*). Common in the Tamar and its tributaries.
- Minnow. (*Leuciscus phoxinus*). Minnis. Often confounded with the three-spined stickleback. Common.
- Loach. (*Cobitis barbatula*). Occurs in Cornwall, but I think it rare. From my experience of it in other counties, I can fully agree with those who say it is "delicious food" (Couch British Fishes, vol. 4, p. 70), if only you can get enough of them to make a dish.



*ESOCIDÆ*.—(THE PIKES).

- The Garfish. (*Belone vulgaris*). The Gerrick. The Greenbone. Bones of a most unpleasantly bright green, but the fish is nevertheless very good eating. Smells most disagreeably when caught. Assembles in shoals in the autumn. Common.
- Greater Flying-fish. (*Exocoetus exilis*). Rare, but has been observed in Cornwall. There are two species of Flying-fish, one leaning to the Gurnards, and the other to the Mulletts. There is, I think, no doubt that the Cornish specimens belong to the Mullet alliance.
- The European Half-beak, (*Hemiramphus longirostis*) and Blunt-headed half-beak (*H. obtusus*) are of exceedingly rare occurrence. Indeed, it is not yet certain that they are distinct.
- The Skipper. (*Scomberesox saurus*). This fish is not common off the Coast of Cornwall, but is well known off the Welsh ports.

*SALMONIDÆ*.—(THE SALMON KIND).

- Salmon. (*Salmo salar*). Common in a few rivers and in the sea, off inlets into which fresh water falls.
- Bull trout. (*S. trutta*). Peal. Sea trout. This fish is often confounded with Salmon peal, which is the young Salmon. It is distinguishable by its blunter head, fuller tail, and redder and less flaky flesh. Couch (British Fishes) distinguishes Salmon trout from this fish, but not, I think, on sufficient grounds. Of slender Salmon (*s. gracilis*), I had an opportunity of showing a specimen to Mr Frank Buckland, and he at once pronounced it a sea trout. It seems probable that all our salmons may be ranged as salmon or sea trout in various stages of developement.
- Trout. (*S. fario*). Common everywhere. I have known this fish in ponds to attain a weight of over 3 lbs. (very large for Cornwall), and I have seen fish of over 1 lb. taken in our smallest brooklets, but the ordinary run of the fish in its wild state taking the county through, is about 2 oz.
- Samlet. (*Salmo Samulus*). Parr. Distinguishable from trout in having its red spots on, or on each side of, the lateral line, instead of scattered over the back, and in having several

dusky bars running from the back across the lateral line towards the belly. It is a small fish, very common in some of the West Dartmoor rivers. It is recorded as frequently occurring in some of the rivers of Cornwall. The only Cornish specimen I myself have ever seen, came from the ponds at Tehidy.

American Lake Trout. (*S. Fontinalis*.) This fish has been recently introduced into the county, at Tehidy, as an experiment. It is said to attain considerable size, and to afford excellent sport.

#### CLUPEIDÆ.—(THE HERRING TRIBE).

Pilchard (*Clupea pilchardus*) is the base of one of the principal fishing industries in Cornwall. Without being a migratory fish (properly so-called) it swarms in from the deep sea in summer and autumn, and keeping in shoals or schools by day, it scatters at night, probably to feed. Shoals have been taken in excellent condition so late in the year as 24th December. A few years since a shoal was taken in the lower reaches of Truro river in the month of February, but in what condition they were, I do not know. I have, however, received pilchards cast on shore in the month of February, and they were utterly unfit for food. It is probable that the sardine is pilchard.

Herring. (*Clupea Harengus*). Large quantities of this fish are taken off our coasts in the fall of the year, but they are nowhere in Cornwall of sufficient importance to maintain a separate fishery.

Sprat. (*C. sprattus*). Any quantity of this delicious little clupeid could be obtained on our coasts if nets of a proper mesh were used, but it happens to come with its more valuable congeners the pilchard and the herring, and it is not therefore separately sought after. When economy in our fisheries comes to be studied, it will doubtless receive the attention of which it is worthy. At present, when a shoal of sprats is captured, some are sold for food at 2d. a quart, but the larger part are sold for manure.

Whitebait (*Clupea alba*) was formerly considered as a distinct fish. It is now certain that some whitebait are young herrings, and it is probable that all whitebait are the young of clupeid

fishes, and that no distinct fish occurs. In some years white-bait swarm on our coasts.

Allice Shad. (*Alosa vulgaris*). Damon (qu: Dame of the) herring. A large and beautiful herring of most delicate flavour. It is by no means uncommon, but is frequently confounded with herring proper.

Twaite Shad. (*Alosa finta*). Not so common as the Allice Shad, but like it, of excellent flavour, and often confounded with herring.

Anchovy (*Engraulis encrasicolus*.) This fish has been taken occasionally in St Ives Bay, but my experience of it is that it is not common.

#### GADIDÆ.—(THE CODFISH TRIBE).

The Cod (*Gadus morrhua*.) Common off all our coasts but rarely taken in good condition for the table. The best are those which have the deepest groove or depression at the back of the head, and the largest "belly," (i.e. greatest depth and distension of the stomach under the first dorsal fin.) Those that fail in this respect, are called by the fishermen, "churchyard cod" and are sure to turn out woolly and watery. No naturalist should ever allow the stomach of a cod to be thrown away without examination. Being bottomfeeders on crustaceans they are invaluable as collectors.

Dorse (*Morrhua callarias*.) This fish is by no means uncommon, but it is generally confounded with cod, to which it is very similar. A cod of rich red brown color over the back will probably turn out to be a dorse. There are external distinctions sufficient to mark the two species but the texture of the flesh is a certain guide. The dorse is firmer and less flaky than the cod, superior to the cod of our seas, but inferior to the "head and shoulders" of London. It also is a good collector.

Haddock (*Morrhua æglifinus*.) An excellent fish for the table in midwinter, but of most uncertain habitat. It frequents a rocky ground in large numbers for years, and then it suddenly leaves it, and is found in some new locality.

Blind (*Morrhua lusca*) Bib. Whiting pout. Blens. Very common, and when of 2 lbs weight and upwards excellent

for the table all the year round. It is despised on account of its boniness.

Power Cod (*Morrhua minuta*.) A miserable little fish, very much like the blind, but longer in proportion to its depth. It is common everywhere.

Whiting (*Merlangus vulgaris*.) This well-known delicacy is abundant off our coasts from September to March. The largest and best are taken off Polperro.

Poutassou (*Couch's Whiting*.) This Mediterranean member of the cod family has occurred twice off Polperro, but has not that I am aware of been recognised elsewhere in the County.

Pollack (*Merlangus pollachius*.) The whiting pollack. Peculiarly a Cornish fish. It is said to be almost unknown East of the Start. An excellent table fish all the year round, but best in winter. A fry of little pollack, about six inches long, will beat a similar dish of Cornish trout at any time.

Coalfish (*Merlangus carbonarius*.) Rauning (qu. Ravening or ravenous) pollack. This fish is common off all our coasts, and attains a very large size, (up to half a hundred weight) off the Land's End. Its flesh is coarser than that of the whiting pollack, but in small specimens it is quite as palatable. The straight white lateral line of this fish distinguishes it at once from the whiting pollack. Couch himself (British Fishes) identifies his "green pollack" with this fish.

Ling (*Lota molva*.) Very common and deserving of much more gastronomic attention than it gets. Good fresh ling is an excellent fish in winter, and Scilly salt ling is a delicacy all the year round. It has been recently suggested that there are two permanent varieties of ling, but this second variety may turn out to be the "torsk."

Hake (*Merluccius vulgaris*.) Sold in London as "Cornish salmon." Very common. Twenty years ago 3s 6d a "burn" (i.e. 21 fish or a "burthen" for one person) was a very high wholesale price for hake in West Cornwall, and 6d a fish was a fair retail price. Now hako commands in West Cornwall a wholesale price of from 15s to 20s a burn, and a retail price from 1s. to 1s. 6d. each.

- Three-bearded Rockling (*Motella vulgaris*.) Whistler. Very common in rocky pools. It is sometimes taken of a large size in deep water. It is considered a delicacy.
- Four-bearded Rockling (*Motella eimbria*.) A small rare fish.
- Five-bearded Rockling (*Motella quinquecirrata*.) A small fish. Common inshore. Very like the Whistler, but never of the size to which that fish attains.
- Mackarel Midge (*Motella glauca*.) A tiny fish. Usually to be found amongst shoals of "bait" (Lance, whitebait, &c.,) which swarm inshore in summer and autumn. Rare.
- Thompson's Midge (*M Coryphæna*.) Mr. Couch records this as having occurred in Cornwall.
- Lesser Forkbeard (*Raniceps trifurcatus*.) Tadpole fish. R. Jago. By no means uncommon; with an extremely unpleasant smell when fresh. Usually taken on hook and line.
- Greater Fork-beard (*Phycis furcatus*.) Hake's dame. Couch (Fauna) speaks of it as "not uncommon in winter;" but my experience of it is that it is rare. The more the pity, its flesh being extremely delicate, and much superior to whiting. Couch (British Fishes) mentions a Blennoid Forkbeard, but after seeing several specimens of Greater Forkbeard at all seasons of the year, I do not find that it can be distinguished from the ordinary fish out of condition.

#### PLEURONECTIDÆ.—(FLAT FISHES).

- Holibut (*Hippoglossus vulgaris*.) Lady fluke. This largest of the British flat fish, which not rarely runs to 8 cwt, is of frequent occurrence off our coasts. It is sometimes of a few pounds weight only. It is edible, but in my own opinion, not good.
- Long Rough Dab (*Hippoglossoides limandoides*, Gunther.) Is reported as having occurred off Falmouth.
- Turbot (*Rhombus maximus*.) Common. This fish is remarkably apt to take its colour from the sands in which it is feeding.
- Brill (*Rhombus vulgaris*.) Common. Very uncertain eating. About one in three is fit for the table.
- Carter (*Rhombus megastoma*.) Mary sole. Whiff. Lantern (because one can almost see through it). Common.

Mullers Topknot (*Rhombus hirtus*). Not well-known, but not uncommon. Its flesh is excellent. I do not think Block's Topknot (*R. punctatus*) has ever been taken in our seas, but the two fish are so much alike that they may well have been confounded. Eckstrom's Topknot (*R. Norvegicus*: Gunther) has been taken in the Bristol channel. Whether that is Cornish water is doubtful.

Megrim (*R. Arnoglossus*) Scald fish. This is not a common fish, and it is not, I think, certain that it is more than a variety (may be the partly developed young) of the "Carter." Gunther calls it "*Arnoglossus Lanterna*." Mr. Couch, (British Fishes), in describing the megrim, refers to some specimens of "*Arnoglossus lophotes*" which probably occurred at Plymouth, but I understand his conclusion and that of Mr. Yarrell to be that these were accidental varieties of the principal fish.

Plaice (*Platessa vulgaris*). Of uncertain occurrence, and very variable value for the table. In observations in Mount's Bay, extending over 25 years, I have remarked that when the Masked Crab (*Corystes Cassivelaunus*) is common in the early spring, Plaice in the summer, and Red Mullet in the autumn, are always abundant. The Plaice from a hard close killas sand are usually good edible fish. Those from a loose granite sand are valueless.

Dab (*Platessa limanda*). Very common, and by no means a bad fish.

Smear Dab (*Platessa microcephalus*) Lemon Dab. Smooth Dab. A very excellent fish. Common in some localities.

Pole (*Platessa pola*). Has been taken in Cornwall, but I am inclined to think only rarely.

Flounder (*Platessa flesus*). Common as a harbour fish and in tidal fresh waters.

Sole (*Solea vulgaris*). Common. Usually captured in nets, but there is no reason why it should not be taken in any quantities on lines if only hooks small enough were used.

Variegated Sole (*Monochirus Variegatus*.) Rare. It is with difficulty that this fish can be distinguished from the common sole until the texture of its flesh be tested.

Lemon Sole (*Solea pegusa*). Couch (British Fishes) mentions one specimen as having occurred at Plymouth, and I have a record of the occurrence of two (on the same day) at Porthcurnow under the Logan Rock. It is rare.

Solenette (*Monochirus linguatulus*). Little Sole. A fish rarely seen, but yet a common one. At its largest size it is so insignificant, that the trawlers who take it fling it overboard as valueless.

### CYCLOPTERIDÆ.—(SUCKING FISHES).

Lumpfish (*Cyclopterus lumpus*) Lumpsucker. Not uncommon. The blue fish being the female, and the red one the male. This fish is remarkably tenacious of life. (Couch abandons the Coronated Lumpfish of the Fauna.)

Sea Snail (*Liparis Vulgaris*). Rare. Has been taken at Falmouth. Also called Butterfish.

Montague's Sucker (*Liparis Montagu*). Common. Probably the Network Sucker (*Lepidogaster bimaculatus*: Gunther) is an accidental variety.

Cornish Sucker (*Lepidogaster cornubiensis*) "The Sucker." Common under stones and in small pools by the seashore. The double spotted Sucker (*L. bimaculatus*: Yarrell) is probably an accidental variety of the Cornish Sucker. It cannot be distinguished from it in a satisfactory manner.

It must, however, be remarked that Gunther and Yarrell apply the term "*bimaculatus*," the one to a fish allied to Montague's Sucker, the other to a fish allied to the Cornish Sucker; and with such authorities as these in view, it may well be that a species exists, intermediate between Montague's and the Cornish Sucker, yet allied to both.

The Sucking Fish (*Echeneis Remora*). Properly belonging to the family *Echeneidæ*. Has occurred attached to Codfish in the Bristol Channel, and has been landed in fresh condition taken off the body of a Shark captured in the Bay of Biscay. These are its only claims to be called a Cornish fish, but it is a pure parasite, and I have no doubt it is to be found (if sought for) on the bodies of some of the large fish occasionally caught, especially attached under the pectorals.



*MURÆNIDÆ*.—(THE EEL TRIBE.)

Sharp-nosed Eel (*Anguilla acutirostris*). The common eel of the county. It is not unfrequently a permanent resident in salt water, but not, so far as I have observed, at any great distance from the shore.

Broad-nosed Eel (*Anguilla latirostris*). Couch (Fauna) speaks of this as "less common than the sharp-nosed eel" (of course in Cornwall). The only specimens I have seen of it have been from the fresh water pond at Treseo in the Scilly Islands. The largest of these weighed 6lbs. 8ozs. when I weighed it, but it wasted 6 ozs. on its way to London, where a cast of it was taken by Mr. Buckland.

The Snig Eel (*Anguilla mediorostris*). Is mentioned by Mr. Couch as having occurred in Cornwall, but I cannot see in what way the Snig differs from what a small sharp-nosed Eel would be.\*

Conger (*Conger vulgaris*). Common everywhere. Varies in its colour with the ground it inhabits. It differs from the fresh water eels in having its upper jaw longer than its lower. There are two varieties, but whether more than accidental, I cannot say. One thick at the "shoulder," and of which a specimen of five feet long would weigh close on 60lbs.; the other thin at the shoulder, of which a specimen of 5 feet long would not exceed 30lbs.

Morris (*Leptocephalus Morrisii*). Mr. Couch records this fish in Fauna with the note of "not uncommon," but he does not, in express terms, in "British Fishes," say it has been taken off Cornwall; and I have never seen nor heard of a specimen, I think it must be accepted as rare. Probably, as happened some years since of the rare Arch-fronted Swimming Crab (*portunus arctuatus*), one summer produced them in unusual abundance.

Muraena (*Muraena Helena*). Very rare. Only one specimen recorded as Cornish or even British. It was taken in 1834.

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\* Yarrell distinguishes it from *A. acutirostris* principally by its habits of feeding and a slight variance in the *proportionate* size of the bones of the skull. These differences may well belong to the old and young of the same species.



*ANGUILLIDÆ*.—(THE LAUNCE FAMILY.)

The Launce (*Ammodytes tobianus*). The ordinary "bait" of our fishermen.

The Sand Launce (*Ammodytes lanea*). Very common. Larger than the Launce; buries itself in wet sands, whence it is fetched out by hooks made for the purpose, it being much too toothsome to be left in its retirement. On comparing Yarrell with Couch and Gosse, it will be found that there is still confusion over this family.

*SYNGNATHIDÆ*.—(PIPE FISHES.)

Great Pipe Fish (*Syngnathus acus*). Common.

Broad-nosed Pipe-fish (*S. Typhlé*). About as common as *S.*

*Acus*.

Ocean Pipe-fish (*S. æquoreus*). The æquoreal Pipe-fish. In some years a common fish.

Snake Pipe-fish (*S. Ophidion*). Most abundant occasionally.

Worm Pipe-fish (*S. lumbriciformis*). A constant visitor, but it is rarely caught.

Sea-horse (*S. Hippocampus* Linnæus). This fish has, I believe, been taken in Plymouth Sound. The closely allied species *S. biaculeatus* has been taken in the Baltic and in the Chinese seas, and it will be hard, indeed, if we do not some day stop a specimen on a visit to its relations.

Blunt-tailed Pipe-fish (*S. brevicaudatus*). In October, 1872, a *Syngnathus* was captured in Mount's Bay, which differed from all the known species in a most remarkable manner. It was described in the Zoologist of October, 1872, second series, No. 85, p. 3274, and received the above name.

*GYMNODONTIDÆ*.—(THE SUNFISH FAMILY.)

Four-horned Trunk-fish (*Ostracion quadricornis*. Linnæus.) One specimen taken off Mevagissey.

File Fish (*Balistes capriscus*). Taken off Port Loe in 1865.

Pennant's Globe Fish (*Tetrodon Pennantii*). Rare. Of this singular fish it should be noted that its "globe" or spinous bladder is inflated by the action of involuntary muscles. I cannot of course say that it may not also be inflated voluntarily.

Sunfish (*Orthogoriscus mola*). Common during every summer.  
 Oblong Sun-fish (*Orthogoriscus oblongus*). Rare.

*STURIONIDÆ*.—(THE STURGEONS.)

Sturgeon (*Acipenser sturio*). Rare.

*SQUALIDÆ*.—(THE SHARK TRIBE.)

The Nurse (*Scyllium stellaris*). The Nursehound. The Roughhound. A bottom feeding shark of considerable size, reaching usually to  $\frac{3}{4}$  of a cwt. Not uncommon.

The Morgay (*Squalus catulus*: Linnæus). The small spotted dog fish. The commonest of our small sharks. A pest to fishermen, but makes good soup, and does not eat badly when salted.

The Black-mouthed Dogfish (*Scyllium melanostomum*). The eyed dog-fish. Only one specimen on record as Cornish or even British. Caught in 1834.

Six-gilled Shark (*Hexanchus griscus*). Rare.

White Shark (*Squalus Carcharias*: Linnæus.) I place this in the list in deference to the authority of Mr. Couch, but I can find no record of the appearance of this shark in Cornish waters.

Blue Shark (*Carcharias glaucus*). A very common pest of our fishermen.

Thrasher (*Carcharias*, or *Squalus vulpes*). Sea Fox. Fox Shark. By no means uncommon. A few are taken every year by the mackerel and pilchard drivers.

Porbeagle (*Squalus Cornubicus*). The Beaumaris Shark. Not uncommon.

Topper (*Galeus vulgaris*.) This fish is beyond question known in our seas, but I do not consider it a common fish. In my opinion the Smooth Hound is often mistaken for it.

The Smooth Hound (*Mustelus laevis*). The Ray-mouthed Dog (it has teeth like a Ray) is common.

The Dogfish (*Squalus acanthias*). The picked dog. A savage brute who knows well how to use his spurs even after capture.

The Spinous Shark (*Squalus spinosus*). Rare. It is at present doubtful whether there are not two permanent varieties of

this fish, one a ground shark, and the other a "round" or swimming fish.

The Basking Shark (*Squalus maximus*). Our largest British fish. Not uncommon in summer.

Pennant's Basking Shark (*Selachus maximus*: Prof: P. Panesi). A Mediterranean fish. Very rare. It has been wrongly described as the Rashleigh Shark and the Broadheaded Gazer. It feeds as the whale does on medusæ or some other exceedingly small marine productions, which it strains through a comb-like arrangement in its gills. Its teeth are rudimentary.

The Hammer-headed Shark (*Squalus zyæna*: Cuvier). Very rare.

The Monkfish (*Squatina angelus*). The Angel fish. Common. Viviparous.

The Centrine (*Squalus centrinus*: Bloch). The first British specimen of this fish was taken off the Wolf Rock in the spring of this year (1877).

Mr. Couch has, so far as I can see, abandoned the Lewis Shark (*Squalus Lewis*) in his "British Fishes."

#### RAIIDÆ.—(THE RAY TRIBE.)

The Skate (*Raia batis*). Common. I do not think the Flapper Skate can be distinguished from it.

The Long-nosed Skate (*Raia mucronata*). Not uncommon in deep water.

Burton Skate (*Raia oxyrhynchus*). Not uncommon in deep water.

The Thornback (*Raia clavata*). Common. I do not think the Starry Ray can be distinguished from it.

The Homelyn (*Raia maculata*). This and the Thornback are our chief edible rays. The Homelyn beyond question includes the Cuckoo Ray of Couch. I have seen them of all gradations from plain Homelyn to most brilliant Cuckoo.

Small-eyed Ray (*Raia microcellata*). The Painted Ray. The Owl. Held in high esteem as an article of food by those who know it. It is a very local fish, but where it is found it is abundant. For instance, off Pra-sand in Mount's Bay, quite three-fourths of the rays caught are "Owls."

- The Sandy Ray (*Raia circularis*). I record this Ray in deference to the authority of Mr. Couch, but I much doubt whether it is not an accidental variety of the Homelyn.
- The Torpedo (*Raia torpedo*). The Cramp Ray. The Electric Ray. Is not uncommon, and yet is rarely observed, because most fishermen cut it away as soon as they see it.
- The Sting Ray (*Trygon pastinaca*). The Fire-flaire. Is of rare occurrence.
- The Eagle Ray (*Myliobatis aquila*) is recorded as having occurred once off the coasts of Cornwall.

*PETROMYZIDÆ*.—(THE LAMPREYS.)

- The Sea Lamprey (*Petromyzon marinus*.) Common.
- The Lampern (*P. fluviatilis*). A river fish. Is said by Mr. Couch to be "Common," and no doubt it is so in the eastern part of the county. With it, should, apparently, go the Silver Lamprey and Planer's Lamprey; but I am now making my conclusions from written descriptions and not from observation, and cannot therefore speak with confidence.
- The Mud Lamprey (*Ammocetes branchialis*). The Pride. Blind Lamprey. Common.
- The Mixine (*Gastrobranchus cæcus*). The Borer. The Hag Fish. Rare.
- Lancelet (*Amphioxus lanceolatus*). A tiny fish, and very rare. All small fish of the deep sea are rare. They escape observation.

I have now closed my list, having followed, as I have before said I should, as closely as possible the classification adopted by Mr. Couch. The advantages to be gained by my doing this seemed to me to outweigh the advantages of a more modern method. I have cited, wherever I could, the scientific names given by Yarrell as rendered by Couch. Where this has been impossible, I have added the name of the naturalist whose nomenclature I have adopted. A list of this sort can never be perfect, and if I have fairly followed in the footsteps of my predecessor (who did the work; I have but revised it) I shall be quite content.

It seems to me that a practical value of local ichthyology lies in its teaching us of our supply of fish as an article of food, and I can say with confidence that very few people, indeed, know the

excessive waste which goes on in this department. We depend for our main supply on four families\*—the mackarel tribe, the herring tribe, the flat fish, and the cods; but it is only the well known members of these families that are eaten. If a rare specimen occurs, it is thrown away, but yet it is certain† that every member of each of these families is not only edible, but good eating. Indeed, with the exception of the larger sharks, the sunfishes, and the globe-fish, there is not, in my opinion, based on an extensive experience, a single British fish which is unfit for food under some form of cookery or other. Whilst of the sharks and rays I can say that their cartilaginous bones under the process of stewing, dissolve into a strong jelly. I suppose this may be so of the globe-fish and sun-fishes, but I do not know it. But it is not only in the fish which we throw away that we make our waste, but in the method of dressing the fish which we cook. We boil turbot and sole, and the water in which they are boiled is (and correctly) thrown away; but if instead of boiling them we dressed them by the process of steaming, we should save from them a quantity of very rich jelly. And then again, how very rarely do we make any use of fish liver! the good housewife who will boil down the bones and scraps of any meat to make stock for soup, will throw away fish bones and scraps with complacency, never recollecting for a moment that fish soups are as good as any other soups, and not aware perhaps that the stock of most of the queen of soups—turtle soup—(a soup by the way wholly of marine origin) when used for public diners or in large hotels is made from conger. The subject is worthy of consideration. We throw away a third part of our fish, and waste a third part of those which we consume.

THO. CORNISH.

*Penzance.*

\* It will be observed that I confine myself to the supply of salt-water fish, I say nothing of Salmon and other fresh water fish; but I apprehend that they are by no means so important a branch of fish supply as the smallest of the families which I have named. The "Gurnards" or the "Conger" are, perhaps, quite equal to the salmons as a source of general fish supply.

† I except Tadpole Fish. I have never tried it, but, its strong smell notwithstanding, I see no reason against its being wholesome food.

## CRUSTACEA.

*Revised and added to by C. Spence Bate, F.R.S.*

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IN complying with the request of the Council to revise the late Mr. Jonathan Couch's list of Crustacea in his Cornish Fauna, I have endeavoured to retain as much as possible of Mr. Couch's words, and to collect from books and other sources the information that he communicated to various authors on this branch of natural history.

I have, moreover, included any new forms that have, since the publication of his Fauna, been published as having been found in Cornwall; and have added from the History of the British sessile-eyed crustacea, a list of all the animals of that sub-kingdom that have been found on the coast of Cornwall.

The original portion of Mr. Couch's Fauna will be distinguished by inverted commas.

It will be seen that the Cornish Crustacea exhibits a very large proportion of the known British forms; and considering the few places as well as naturalists that have been engaged in the observation of these animals, I think there can be little doubt but that many other forms may yet be added to the local and probably to the British Fauna.

C. SPENCE BATE.

Plymouth, Dec. 28th, 1877.

## CRUSTACEA.

"The class of articulata, or "*Arthropoda*" that are known as Crustaceans, in which are included the families of Crabs, Lobsters, Shrimps, Sea Screws and others recognized as Entomostracous or Insect Crustaceans, may be popularly described as "animals without an internal vertebral skeleton, but having the body divided into distinct rings moveable on each other by joints; the integument forms a crust or external skeleton; antennæ or

feelers, and eyes separately on footstalks or sessile. The mouth formed by the adaptation of several pairs of appendages varying in separate orders to assist in manducation. The legs with several joints, some of the higher groups being variated into prehensile appendages. Vent at the extremity of the animal."

"The stalk-eyes Crustaceans possess a carapace or shelly crust above the thorax or *Pereion*, within which the principal organs of life are protected, the branchiæ or gills for breathing are not branched; five posterior pairs of appendages belonging to the thorax or *Pereion* only formed for walking.

"They are arranged by Dr. Milne Edwards in his *Histoire des Crustacés*, 1830, into three great sections, of which the separate characters are"

"BRACHYURA or short-tailed Crabs, having the pleon or abdomen, vulgarly called the tail, slightly developed, having none of its appendages adapted for swimming and destitute of fan-like caudal plates," or uropoda.

"ANOMEURA, abdomen or pleon well developed, with a portion bent under the thorax or pereion, with terminal caudal plates" or uropoda.

"MACROURA, abdomen or pleon well developed and extended, having paddles (pleopoda) beneath and terminal fan shaped uropoda or caudal plates."

The Order of the Brachyura is again divided into the following families, *Oxyrhynchidæ*, *Macropodidæ*, *Maiadæ*, *Parthenopidæ*, *Canceridæ*, *Portunidæ*, *Pinnotheridæ*, *Grapsidæ*, *Leucosiadæ*, &c.

### MACROPODIDÆ. (SEA SPIDERS.)

GENUS STENORHYNCHUS.—*Lam.*

"Second pair of legs much longer than others; the stalk of the external antennæ inserted before the level of the eyes, of which the footstalk is very short."

STENORHYNCHUS TENUIROSTRIS—*Leach*—*Smaller Sea Spider.*

" LONGIRORTUS—*Couch's Cornish Fauna*

"Common at the depth from two to twenty fathoms, often taken in crab-pots."

" STENORHYNCHUS PHALANGIUM—*Pennant*—*Long-legged Spider Crab.* "Common at the mouth of rivers—*Leach*; off the south coast of Cornwall. *Bell*, C.S.B.

GENUS *ACHÆUS*.—*Leach*.

"Snout not much lengthened, and on each side leaving uncovered the insertion of the stalk of the external antennæ. The terminal joint of the two posterior pairs of legs is large, compressed and falciform."

*ACHÆUS CRANCHII*.—*Leach*.—*Cranch's Spider Crab*.—Not common.

Deep water among weed, and from its small size probably frequently overlooked."

GENUS *INACHUS*.—*Fabr*.

"Differing from the two former genera in having retractile eyes capable of extensive motion, second pairs of legs thrice as long as the first-frontal portion of the carapace; terminal portions of the four hinder pairs similar and slender."

*INACHUS DORSETENSIS*.—*Leach*.

„ *SCORPIO*—*Couch's Cornish Fauna*—"Scorpion Spider Crab.—Commonly taken in crab pots within a few miles of the shore at all depths."

"*INACHUS DORHYNCHUS*—*Leach*—*Fecble Inachus*.—Common, not unfrequently found on board crab boats."

"Except in the rostrum it has much of the aspect of *Stenorhynchus longirostris*, but is less common."

*INACHUS LEPTOCHIRUS*.—*Leach*.

„ *LEPTORHYNCHUS*—erroniously given by *Edwards* and *Couch*—*Small Snouted Inachus*.—Taken off the coast of Cornwall by *Cranch*.

*MAIADÆ*. (MAIANS.)GENUS *PISA*.—*Leach*.

"Rostrum much developed, stout, formed of two lengthened horns, somewhat conical; stalk of the external antennæ nearly on the level of the rostrum."

"*PISA TETRAODON*—*Milne Edwards, Crust., Vol. 1, p. 305*—*Four-horned Spider Crab*.—Much larger than the other spider crabs and far more formidable in appearance. Not common."

*PISA GIBBSI*.—*Leach*.—*Gibbs' Spider Crab*. Not uncommon in from about twenty fathoms of depth, and taken in crab-pots."



GENUS HYAS.—*Leach.*

“Distinguished from *Pisa* by the absence of the strong spine which in that genus forms the anterior portion of the circle of the orbit; and by the second member of articulation of the outer antennæ being flattened and widened on the outer side.

HYAS ARANEUS—*Linnaeus*;—*Spider Hyas*.—*Milne Edwards, Hist. des Crust., Vol. 1, p. 312*; *Leach, Malac. p. 121*; *Pennant, p. 19, fig. 16*.—Off the S. coast of Cornwall. C.S.B.

HYAS COARCUATUS.—*Leach, Mul. pl. 21*; *Milne Edwards, Hist. des Crust., Vol. 1, p. 312*.—Off the S. coast. C.S.B.

Although Mr Couch wrote in the previous edition of his Cornish Fauna that he was not acquainted with either of these species and therefore supposed them not to be common, it is recorded as having been taken off the Cornish Coast upon his authority in Bell's crustacea. And he also mentioned that specimens taken off the coast of Cornwall are in the museum of the Athenæum at Plymouth.

GENUS MAIA.—*Lam.*

“The stalk of the external antennæ inserted into the internal angle of the orbit, and uncovered; nippers of the hand slender and pointed.”

MAIA SQUINADO—*Herbs, Corwich or Skerry*.—*Milne Edwards, Hist. des Crust., Vol. 1, p. 327*.

Mr. Couch in the previous edition of the Cornish Fauna mistook the Mediterranean species, *M. Verrucosa*, for this, but it differs in having tubercles instead of spines on the dorsal surface. Mr. Couch says that this species “in its season is the most abundant species of the family, and by far the largest, sometimes weighing as much as five pounds, and the carapace measuring from nine to ten inches in length; so that it is commonly used as food, though only by poor people and fisher-boys, who find in it a delicate meal. Its not tempting form and the small size of the legs conspire to exclude it from the tables of the rich.”

The information in Bell's account of this animal in his British stalk-eyed crustacea is mostly from the pen of Mr. Couch, and I therefore do not hesitate to transfer it in full. He says “This is the most abundant of all the crabs found on our coast, but it does not make its appearance as early in the season as the

common crab, the lobster, or indeed any other; it is rarely found earlier than May, but from that time till the end of the fishing in August or September, these crabs make their appearance in vast numbers, to the great vexation of the fishermen; for it is found that from the time these begin to enter the pots, the more valuable kinds considerably decrease in number; and this is supposed to arise from their restless activity. No sooner are they in the crabpot than they are continually in motion, scrambling from one part to another, and in this way frighten the crab and lobsters and prevent them from entering.

“In the spring and early part of the summer they lie concealed beneath the sand in deep water. About May they leave their places of concealment, but never come into shallow water, as does the common crab. The latter is often found in crevices of rock or beneath stones left by the receding tide, but this is never the case with the *Corwich*. They shed their spawn about August or September at some short distance from the shore, most probably in the sand. In this too they differ from the common crab, for even when the spawn is quite mature for casting, they enter the pots as readily as at any other time, whilst on the other hand it is a very rare occurrence to catch the common crab with spawn, unless it be with a dredge net. It would seem that either they grow fast, or that the young differ considerably in their habits from the larger ones; for whilst it is very common to find specimens measuring nine or ten inches in length of the carapace, it is very rare indeed to get one less than three inches, and a fisherman tells me that after many years fishing he caught one about the size of half-a-crown, which was the smallest he ever saw.

“The ova when quite ready for shedding are about the size of a very small mustard seed, and of a reddish brown colour, besprinkled with dark spots.

After keeping them suspended in sea water for twenty-four hours, some of the ova dropped from their attachments, and soon after the young escaped, and this is evidently by their own exertion, as distinct motions were easily observable under the microscope while they were yet enclosed. When they first escape, they are as it were rolled on themselves, the caudal extremity being bent on the body; but this is soon changed for

the position of a straight line. I could detect no spine on the anterior part of the carapace, which was quite smooth, but marked with dots. The eyes are sessile and large, the claws, particularly towards the extremity, covered with minute hairs."

The figures of the young or zœa form are given in Mr. Bell's work from Mr. Couch's drawings, who says that an ordinary sized Corwich bears at one time upwards of seventy-six thousand eggs.

### *PARTHENOPIDÆ.* (PARTHENOPANS.)

#### GENUS, EURYNOME.

"Eyes retractile; joint of the hand more or less triangular and armed. First joint of the outer antennæ fused with the frontal plate, and giving insertion to the next articulation on the fore part of the level of inner canthus of the eye."

*EURYNOME ASPERA.*—Rough Eurynome.—*Milne Edwards, Hist. des Crust., fig. 1, p. 357; Leach, Malac., p. 17; Pennant, p. 9, fig. 20; Bell, Hist. Brit. Stalk-eyed Crust., p. 46.*

There is a specimen in the museum of the Athenæum at Plymouth.

"The length of the legs in this family of Crabs necessarily leads to slowness of motion; but they are well fitted to a residence among rocks and stones covered with seaweed, among which they stride with little difficulty. In the winter, they become almost, if not altogether torpid, concealing themselves at this season either in deep crevices of rocks or embedded in the soil; for the Corwich crab has been observed when caught at the time of its first activity in April to have the inequalities of its carapace covered with the mud of the bottom. It is perhaps at this period of repose that the crops of seaweed and corallines (*Sertularia* &c.) fix themselves, as they are often seen beautifully adorning them; shells of different species, but especially oysters and mussels, are also found adhering, and on the smaller kinds, as of the Genera *Inachus* and *Pisa*, and sponge will grow so luxuriantly as to conceal the whole carapace with tufts from the legs to the extremities.

"In the spring the spider crabs appear in water of the depth of a few fathoms; but as the weather grows warmer they approach the shore and in summer climb the rocks, so as sometimes to be left by the receding tide. At the season of the greatest activity, the corwich crab becomes so abundant that as no one thinks of

purchasing them they are regarded as a great annoyance by the fishermen; for it is found that when they occupy a crab-pot no lobster will enter it. I have been informed of nearly a cart load having been taken at one haul of a ground seine, and singularly enough the whole were found to be females. It is indeed a matter of general observation that the females exceed the males in the proportion of perhaps 10 to 1; and during the summer they are all well laden with spawn, which having been carried beneath the flap as in other crabs, for several months, for the sake of full exposure to the water and light, are dropped in some concealed places, where they elude observation, for I have not succeeded in finding one of a very small size." This may be accounted for by the fact that when in the zoea form the young animal swims on the surface of the sea in a form unlike the parent.

### CANCERIDÆ.—(CANCERIANS.)

GENUS, XANTHO.—*Leach*.

„ XANTHO.—*Couch*.

Carapace large, horizontal, a narrow fissure dividing it into two portions, the separating line furrowed; cavities of the antennæ transverse, separated by a slender partition, antennæ short.

XANTHO FLORIDUS—Furrowed Crab.—*Leach, Malac. pl.* 11; *Milne Edwards, Hist. des Crust., fig.* 1, *p.* 294; *Bell, Brit. Stalk-eyed Crust., p.* 51.

Bell says that "it is found in considerable numbers on the Coast of Cornwall and Devonshire, and also in Dorsetshire. It has been observed on several parts of the Coast of Ireland. Of its peculiar habits nothing is known."

XANTHO RIVULOSA—*Leach, Trans. Sin. Soc. xi, p.* 320; *Bell, Brit. Stalk-eyed Crust., p.* 54; *Milne Edwards, Hist. des Crust., t.* 1, *p.* 394.

"Equally common with the last and in similar situations, under stones about low water mark."

This species is known in the Mediterranean sea, and it has been taken at Antrim, in Ireland. Mr. Couch informed Mr. Bell that it is rather more common than *X. florida*, in Cornwall.

XANTHO TUBERCOLATA.—R. Q. Couch, *Bell's Brit. Stalk-eyed Crust.*, appendix p. 359.

This species, which was first described by Mr. Bell in his book, on the British Crustacea, was added to our Fauna by the late Mr. R. Q. Couch, of Penzance, son of the author of the first edition of this report.

Mr. Couch says that it appears to prefer deeper water than the other two species, as he found it repeatedly in crevices of *Eschara foliacea* in the deep water off the Runnell Stone, in Mount's Bay. In the summer it approaches the shore and is found under stones. It spawns in June. Mr. Bell adds "the name *tuberculata* has been given to the species by its discoverer, from whom and from his father, Mr. Jonathan Couch of Polperro, I have had so many claims upon my acknowledgments for their intelligent and ready assistance in the progress of the present work."

GENUS, CANCER.—*Lin.*, *Leach*, *Bell*.

„ Platycarcinus.—*Edwards*, *Couch*.

Carapace approaching to a transverse oval without furrows.

CANCER PAGURUS.—Edible Crab.—*Linn.*, *Leach*, and *Bell Brit. Stalk-Eyed Crust.*, p. 59.

Platycarcinus pagurus.—*Edwards, Hist. des Crust.*, t. 1, p. 413; *Couch, Cornish Fauna*, p. 68, 1838.

This is the species so highly esteemed for the table, and for which a regular fishery is carried on. The male, called the Stool crab, is much the larger, not uncommonly weighing a dozen pounds, whilst the female, termed the Bon crab, is rarely half that size. Although this crab is somewhat affected by cold weather, so that it is most abundantly caught in summer, its activity is not diminished by it, and some may be obtained at all seasons. The fishery, therefore, is more influenced by the danger to which the pots set to take them are exposed in stormy weather, than by the absolute scarcity of the crabs. The haunts are along the edges of the rocks, in situations varying from low water mark to about 20 fathoms, and the selection is perhaps as much influenced by the facility of hiding or burrowing, as by the supply of food. The Bon crab begins to breed when about three inches across the carapace; and the spawn after remaining long attached to the parent, is buried beneath some shelter at all seasons of the year; but when engaged in this duty the female feeds

but little and commonly hides herself, few of them are taken in the pots. Fishermen mention such instances as somewhat remarkable, though most other crustaceans are familiarly taken with the "pea" attached.

The eggs are commonly shed while the parent is hid in the sand; and the young, of very small size, may be found beneath stones at low water mark; but there are some differences in this, as in some other of the habits of the different sexes; for among the multitudes of young found as described I have never been able to discover a female.

The trap made use of in taking crabs and lobsters is made of wicker work, in the form of the ordinary dome-shaped mouse trap, with the difference that the only entrance is at the top, and that the bottom is immovably joined to the structure. It is about two feet and a half high, and the bait is fastened within, between the neck of the entrance and the sides, by wooden skewers, so as to be seen at the greatest distance.

The skate and other fishes not generally sold in the market are used for bait, and it is found that the freshest only will attract the crab, whilst for lobster it is best when hung for several days to become tainted.

The pot is weighed down by a couple of stones fastened within, and the place is marked by a line with single corks along its course and a buoy at the end. The pots are *hauled* or examined every morning, at which time they are rebaited, and the crabs and lobsters conveyed to the store pots, which are much larger than the others, and are suspended near the surface by a small barrel fastened above, the more effectually to secure them from the voracity of ravenous fishes that prowl below. In this manner the fish are preserved until the arrival of the Well-Boat or Lobster Smack which comes periodically to convey them to the market.

When first taken it is usual to drive a wooden peg into the joints of the prehensile claws to prevent their injuring each other, and no food is afforded as they will endure long abstinence without suffering although they can live but a very short time without a renewal of water. In the small collection of a few dozens kept together in the store pots, this source of injury is indeed of small importance; but in the well of the lobster smack



it is essential, and I have been informed that when a vessel has been detained in harbour, it has been found necessary to go to the open sea and back to renew the water in the hold that the cargo may be kept alive.

The master of the lobster smack has a method of dealing with the fisherman that must not a little redound to his own advantage. If the lobster exceeds the length of eleven inches from snout to tail it is considered a full size fish or tale, of which the price was (in 1833) 10s. per dozen; but all that fall short of that length are regarded as only amounting to half the price.

A crab of the largest size can pass for no more than half the value of a full lobster, but if less than eight inches across the shell or carapace, they are half of a full or tale crab, and none are admitted that measure less than four inches.

Crab fishing is followed chiefly by the poorer fisherman, or by those whose activity has given way to the infirmities of age. It was formerly more profitable than now, and seems to be gradually decreasing. The lobster smacks that pass along the Cornish coast collecting the produce of the fishing of the two or three preceeding weeks, are mostly from Southampton, but the destination of the cargo seems to be the port of London.

In the report for 1843, of the Royal Polytechnic Society, Mr. Couch published a paper on the process of exuviation in crabs and lobsters, and again in the report of the same society for 1854, he published "a particular description of some circumstances hitherto little known, connected with the process of exuviation in the common edible crab;" in the latter communication he demonstrated the manner in which the larger claws split previously to the old shell being cast.

In the report of the recent commission (1877) on crabs and lobsters, the evidence went to prove that there was no decrease in the quantity of animals taken but that there is a larger demand, and a greater number of fishermen. The price of crabs is now (1877) 15s. per doz. for males, and 3s. per doz. for females.

CANCER INSOCRENATUS.—*Couch, Cornish Fauna*, 1838, p. 69-70.

"Carapace large, oval, somewhat elevated in the middle; points of the nippers not spoon-shaped. Legs short, compressed, those which are prehensile furnished above with a crest formed of a

row of spines or tubercles; terminal portion of the walking legs short and pointed.

No British example of this species has hitherto been known; but a specimen has come to my hands that belongs to this section, though I have not been able to refer it to any known species.

It was found in a crab pot in June, 1837, and though of small size, appearing to the fisherman to be of rare occurrence, it was reserved for my inspection. It was scarcely the fourth of an inch across the carapace, the form and colour resembling those of the common edible crab, but the antennæ were covered with small wavy protuberances. On the margin between the ocular cavities were five segments (lobes) the central most projecting; on the lateral margin were nine crenations, each, as those between the eyes, distinctly but finely notched. Antennæ, small, fine, simple, and with the palpi resembling those of the common crab. Hand claws and walking legs short, the two outer segments (joints) with a serrated crest, and the finger also notched at its root, walking legs with short bristles.

It may be that it is not uncommon, as its small size may easily cause it to be overlooked."

Most probably this is the young of some known species. I am not aware that it has been seen by any one but Mr. Couch. Bell does not notice it. It appears to me to resemble *Pilumnoides* of Edwards and Lucas.

#### GENUS, PILUMNUS.

Second portion of the outer antennæ placed in the inner canthus of the orbit, and extending beyond the front. Carapace rounded over the summit and without lines

PILUMNUS HIRTELLUS.—Furry pilumnus.—*Leach, Malac. Brit., t. 12; Milne Edwards Hist. des Crust., t. 1, p. 417; Pennant, pl. 6, fig. 11.*

"Common under stones at low water."

This appears to be a widely extended species, having been found, according to Bell, in Mediterranean, Red Sea, East Indies, and other parts of the coast of Asia, Australia, and both Eastern and Western coasts of South America.



## GENUS, PRIMELA.

"Carapace rounded in front, and about as wide as long, strongly embossed, and toothed at the sides, the third articulation of the inner foot-jaws giving insertion to the next on its internal edge."

Mr. Bell defines the genus as being most easily recognised from all other *Canceridae*, in the circumstance that the external foot-jaws are advanced over the epistome to the antennary cavities.

PRIMELA DENTICULATA.—*Leach. Malac. Brit. pl. 3; Milne Edwards, Hist. des Crustacea, t 1, p. 424.*

"This is the only known species of the Genus, and is not common."

It has been taken all round our southern coast and in one or two places in Ireland. It is a species that is not littoral, since it is generally taken in the trawl refuse.

## PORTUNIDÆ.—(SWIMMING CRABS.)

## GENUS, CARCINUS.

Terminal articulations of the hindmost legs lancet shaped flat and broad, carapace broader than long, front advanced.

CARCINUS MÆNAS—Common Harbour Crab.—*Leach, Malac. pl. 5; Pennant, pl. 2, fig. 5; Milne Edwards, Hist. des Crust., vol. 1, p. 434.*

One of the commonest crabs of our shores, where it hides under stones on the beach but never goes far from land. It is a hardy species, easily kept in confinement for the sake of observation, and has even survived the being kept in fresh water. It lives in fresh water streams where the sea enters.

The development of this crab has been observed through all its stages from the zœa to the adult form, and it seems to be one of progressive morphology.—(Vide Phil. Trans.)

GENUS, PORTUNUS.—*Leach, Bell.*

"Platyonychus.—*Edwards, Hist. des Crust., V. 1, p. 434; Couch.*

"Hinder legs with a wide and oval joint; corresponding part of the other legs straight and unfit for swimming."

This definition of Couch's is scarcely sufficient to determine the Genus from that of *Portunus*. *Portunus* is easily detected by

the form of its carapace, which is Lyre-shaped, and is as long as it is broad.

Mr. Bell considers it to be a distinct Genus from *Platyonychus*, but I doubt if he has made out more than a specific separation, even if he has good evidence of that.

*PORTUMNUS LATIPES*.—Wide Foot.—*Pennant*.

*Platyonychus latipes*—*Edwards, Hist. des Crust., t 1, p. 436; Couch's Cornish Fauna, p. 71.*

*Portumnus variegatus*—*Leach, Bell, Hist. Stalk-Eyed Crust., p. 85.*

It is found at low water mark on sandy beaches, in many places, where it burrows. Though not common it is tolerably abundant where taken.

GENUS, *POLYBIUS*.—*Leach*.

Carapace nearly circular, much depressed, anterior margin dentated, posterior pair of legs having the terminal joint flattened for swimming.

*POLYBIUS HENSLOWII*.—Nipper or Henslow's Swimming Crab.—

*Leach, Malac. Brit., t. 1, 9; Milne Edwards, Hist. des Crust., t. 1, p. 439.*

"This, more than any of the others, is a swimming crab; for whilst the other British species of this family are only able to shoot themselves along from one low prominence to another, the nipper crab, as our fishermen term it, mounts to the surface over the deepest water, in pursuit of its prey, among which are numbered the most active fishes, as the Mackerel and Rauning Pollock, the skin of which it pierces with its sharp pincers, keeping its hold until the terrified victim becomes exhausted. We are witnesses to this curious method of obtaining food in the summer only, at which season the fishermen's nets intercept them and their prey together; and it is probable that, in colder weather, they keep at the bottom in deep water, from which, however, I have never seen them brought in the stomachs of fishes, so far as my observation extends. It is only or chiefly the male that pursues this actively predaceous existence; but that for a time they also remain quietly at the bottom, appears from the fact that while, for the most part, the smooth and flattened carapace is clean, I have occasionally seen it covered with small corallines. (*Sertularia*)."

The foregoing passage has been quoted at length in Bell's *Stalk-Eyed Crustacea*, p 118.

GENUS, PORTUNUS.—*Leach*.

Terminal articulation of the posterior legs formed flat for swimming. "Moveable stem of the outer antennæ composed of two articulations, and inserted on the same line with the eyes and inner antennæ; their basilar articulations fixed in front and entirely separating the orbit and cavity of the antennæ."

PORTUNUS PULBER.—Velvet Crab.—*Leach's Malac.*, p. 16 ; *Milne Edwards, Hist. des Crust.*, t 1, p. 431 ; *Bell's Brit. Stalk-Eyed Crust.*, p. 90.

Cancer velutinus.—*Pennant*, pl. 4, fig. 8.

"This is the largest British species of the family, sometimes measuring four or five inches across the carapace. It is also the most active and fierce, running with great agility on the appearance of danger, but stopping and assuming the attitude of defence when closely pressed. The largest keep in water at the depth of a few fathoms, and the smallest about low water mark, among stones, beneath which they shelter themselves."

Writing to Mr. Bell Mr. Couch says:—"It scizes an enemy suddenly and holds him with tenacity."

Mr. Bell says "that he has occasionally seen it brought to the London market with *Carcinus Manas*, and it is taken in large quantities on the French coast as an article of food."

A friend residing in the Channel Islands informed me that it is preferred in that locality as a greater luxury than the common edible crab.

PORTUNUS DEFURATOR.—Cleanser Swimming Crab.—*Linn.*, *Pennant*, *Leach Malac.*, pl. 9 ; *Bell Brit. Stalk-Eyed Crust.*, p. 90.

Portunus plicatus.—*Milne Edwards, Hist. des Crust.*, t 1, p. 442 ; *Couch's Cornish Fauna*, p. 71.

"Common, with much of the habits of the last species. There is some difficulty in assigning the proper synonyms, to this and the two following species, which are described as inhabiting our coasts, and it is probable that we have one or more to which none of the descriptions apply. They are all termed harbour or Mary crabs, and all exceedingly ravenous, fastening eagerly on any animal substance that comes within their reach."

It ranges from ours and the Irish coast to the Mediterranean sea, where it was first observed by Risso at Nice.

PORTUNUS LONGIPES.—Risso.—*Milne Edwards' Hist. des. Crust.*, t 1, p. 445.

Portunus dalyelii.—*Spence Bate, Ann. Nat. Hist.*, 1851, p. 320, t xi, fig. 9.

This species was taken first off the coast of Cornwall, by Prof. Ed. Forbes and Mr. McAndrews, and afterwards at Falmouth by Mr. Cocks, and at Penzance by Mr. R. Q. Couch.

Professor Bell says that it is doubtless the same species as that described as *P. dalyelii*, l. c. by Spence Bate in the *Ann. Nat. His.* for 1851, which he took off the coast of South Wales. But certainly the Welsh species is more pronounced in its character than the figure given by Prof. Bell.

PORTUNUS MARMOREUS.—Marbled Crab.—*Leach, Malac.*, pl. t viii; *Milne Edwards, Hist. des. Crust.*, t 1, p. 442.

Cancer Depurator.—*Pennant, pl. 2, fig. 6.*

This species receives its name from the beautifully coloured and variegated carapace, which is more conspicuous in the males than in the females.

PORTUNUS HOLLSALUS.—Livid Swimming Crab.—*Fabr. Milne Edwards, Hist. des. Crust.*, t. i, p. 442; *Bell's Brit. Stalk-Eyed Crust.*, p. 109; *Couch's Cornish Fauna*, p. 72.

Portunus lividus.—*Leach, Brit. Malac.*, pl ix, fig. 3-4.

Bell says l.c., p 110. "The occurrence of this crab is extremely rare on our coasts. Dr. Leach had only seen one prior to the publication of his work, but there is now a fine series in the collection of the British Museum."

PORTUNUS CORRUGATUS.—Wrinkled Swimming Crab.—*Leach, Malac. Brit.*, t. viii; *Pennant, pl. 5, fig. 9*; *Bell, Stalk-Eyed Crust.*, p. 94.

Scarce. Bell says that it must be considered as one of the rarer species of the Genus. Leach mentions specimens as having been taken by Mr. C. Prideaux, in Plymouth Sound, and Mr. Bell has had a fine female specimen from the same locality.

It has been found as far north as Skye, and it is recorded from Carrickfergus, Dublin Bay, and Cork Harbour, in Ireland, and Berwick Bay on the Eastern Coast of England. *Milne*

Edwards says that it is very common in the Mediterranean. Risso does not mention it, unless, as is not improbable, that his species of *P. Leachii* be identical with it.

PORTUNUS PUSILLUS.—Dwarf Crab.—*Leach, Malac. Brit. Crust., t. ix; Milne Edwards, Hist. des. Crust., t 1, p. 444; Bell, Brit. Stalk-Eyed Crust., p. 112.*

*P. Maculatus.*—*Risso, Hist. Nat. En Merid., V, p. 5.*

Common. Bell says that this species inhabits deep water and is common on the Coasts of Devonshire and Cornwall. It is found from the Isle of Man to the Mediterranean sea, from which it has been recorded by Risso and Roux.

Its ordinary size is about four lines in length. But Mr. McAndrew took a male off the Isle of Man fully an inch in breadth and eight tenths of an inch in length.

### PINNOTHERIDÆ.—(PARASITIC CRABS.)

GENUS, PINNOTHERES.—*Fabr, Leach, Edwards.*

Antennæ small, short, eyes impoverished, small, on short peduncles; carapace round, globular; chelæ, sub-equal, legs short. These crabs inhabit the shells of bivalve Mollusca.

PINNOTHERES PISUM—Pea Crab.—*Pennant, pl. 1, fig. 1; Leach, Malac. Brit., t. 14; Milne Edwards, Hist. des Crust., t. 2, p. 30; Bell, Brit. Stalk Eyed Crust., p. 121.*

“This species seems rare with us and only found in the Mussel shell, the natural inhabitant of which it either finds diseased or renders so. I have never found it in the *Pinna* as reported by authors, though many have been examined for that purpose.”

Mr. Ball informed Mr. Bell that he had, on two occasions, taken a great number of *Pinnotheres*, which were all males, from *Cardium edulis* (the common cockle), nine out of every ten contained a crab. On opening oysters at Tenby, in Wales, he has likewise procured this crab, and says that at every age it generally selects such shell as with out-stretched legs it would fill from side to side.

The young or zœa of this crab has been described and figured by Mr. Vaughan Thompson in the *Entomological Magazine*, vol. iii, p. 88, which has been copied into *Bell's British Stalk-Eyed Crustacea*, as a vignette to page 125.

PINNOTHERES VETERUM—Pinna Pea Crab.—*Bell*. Ancient Pea Crab.—*Couch*, *Bosc*, *Leach Malac. t. 15*; *Milne Edwards, Hist. des Crust., t. ii, p 32, pl 19*; *Bell, Brit. Stalk-Eyed Crust., p 72*.

“This is more rare than the last named, but there is a specimen in the Museum of the Athenæum, at Plymouth, as also of *P. Varius* of Leach, and either marked by that gentleman or Mr. Prideaux, but which is supposed by Dr. M. Edwards to be identical with *P. Pisum*, a species that is subject to variation at different stages of growth.”

According to Bell it has been found in *Pinna ingens* both on our Coast and in the Mediterranean: it has also been taken in *Modiola* and in the common oyster.

Bell considers that *P. Montagu* of Leach is a variety only of this species.

### GONOPLACIDÆ.—(ANGULAR CRABS.)

#### GENUS, GONOLAX.—*Leach*.

“Foot-stalk of the eyes long, received into a cavity occupying the chief part of the anterior border of the carapace. Carapace angular and extended laterally.”

GONOLAX ANGULATA—Square Crab.—*Milne Edwards Hist. des Crust., t. ii, p. 61*; *Pennant pl. 5, fig. 10*; *Bell's Brit. Stalk-eyed Crust., p 130*.

*G. hispinora*.—*Brit. Malac., t. xiii*.

“Common, in moderately deep water, and often in the stomach of fishes.”

It is rare in Ireland where it has been taken mostly on the south coast. It has not been recorded from Scotland.

It is a Mediterranean species, and has been recorded from the southern and north-western coasts of France.

Mr Couch next describes a very doubtful species under the name of *Gelasimus Belli*, which Mr. Bell thinks may be the young of Roux's *Gonolax rhomboides*, which most carcinologists consider as a variety of *Gonolax angulata*. I copy Mr. Couch's description in full, so that observers may be able to verify his observations.

GENUS, *GELASIMUS*.

"Foot-stalk of the eye long and slender, the transparent cornea small. Carapace resembling that of *Gonoplax*, but more advanced in front, and less extended laterally.

This family (by Genus) is by Dr. M. Edwards placed among the *Ocypodidae*, but is here coupled with *Gonoplax* from the great similarity of form and habit of the following species.

In the history of Crustaceans by Dr. M. Edwards, no notice is given of any species of this Genus as found in the European seas; and therefore I feel some hesitation in assigning to it a species frequently found in the stomach of fishes taken in depths varying from five to more than twenty fathoms, but of which no figure is found in the works of Pennant or Leach.

The form of the Carapace is represented by Dr. M. Edwards, pl. 18, fig. 10, and consequently much resembling that of *Gonoplax*; but that of the present species differs from the figure by that gentleman in possessing a second and well-marked hook on the lateral margin a little behind the anterior angle, and at the place where in the *Gonoplax bispinosa* there is a protuberance much less marked, but giving origin to the trivial name. Both claws are of equal size and less than the transverse breadth of the carapace. The eye-stalks are concealed in the manner of *Gonoplax*; but as the carapace is more advanced at the separation of the ocular cavities, when withdrawn, their extremities point a little backward.

I find but little difference in the form of the male and female, and none in the proportion of the claws, though such is the case for the most part in Crustaceans. I have provisionally designated it *G. Bellii* (Couch MS and fig.) in honour of the professor of Zoology in Kings' College, whose labours have been eminent in this department of science."

*GRAPSIDÆ*.

GENUS, *PLANES*.—*Leach*.

„ *Nautilograpsus*.—*Edwards*.

„ *Pachysoma*.—*De Haan*.

Carapace quadrate, straight in front, rounded posteriorly. Orbits placed at the latero-anterior angles, space between the eyes half the width of the carapace. First pair of legs chelate robust.



not longer than the carapace; remaining pairs compressed, a little longer and more slender than the first.

Bell says that he has given this name to the genus because it was applied by Leach in MSS. in the British Museum, and adopted by Bowdich in his "Excursion in Madeira and Porto Santo."

PLANES LINNEANA.—*Leach MSS.*—Floating Crab.

This is a stray inhabitant of our shores, and drifted hither after Atlantic gales. Its proper habitat is the Sargossa or Gulf-weed of Mid-Atlantic. Sloane says that it was these crabs that Columbus, finding alive on the Sargossa floating in the sea, concluded himself not far from some land, in the first voyage he made, on the discovery of the West Indies.

In our report to the British Association on the marine Fauna and flora of S. Devon and Cornwall, Mr. Couch says, "In the spring of the present year, 1867, an example of the Hawk's-bill Turtle was taken in the channel, at not a great distance from the French coast, and therefore not to be classed as British; but when brought alive and active into Polperro there were found, adhering closely under the shelter of its tail, two full grown examples of this crab; the situation evidently chosen for support and shelter; for from the structure of their hind legs, it does not appear probable that they can maintain themselves at the surface without the aid of some extraneous support."

Mr. Couch says "a species of the Genus Grapsus is in the Athenæum at Plymouth,, under the name of *G. Pelagicus*, by Mr. Prideaux, and known to Dr. Leach, but not in any published work. It is understood that the collection in the Museum of that Institution is confined to specimens taken on the borders of Devon and Cornwall."

### LEUCOSIADÆ.

GENUS, EBALIA.—*Leach, Edwards, Bell.*

Carapace rhomboidal, angles rounded, antennæ small, eyes having short foot-stalks.

This is the only British genus in this family.

EBALIA BRYERII—Bryer's Ebalia.—*Leach, Malac Brit.*, p. 125;  
*Milne Edwards, Hist. des Crust.*, t. 2, p. 128.



"Rare. Mr. Couch says that this is the only species that he has met with, and Dr. M. Edwards thinks that the others named are only varieties. The other two are in the Athenæum at Plymouth."

It has been taken at Scarborough, and is rare in Ireland.

**EBALIA CRANCHII**—Cranch's Ebalia.—*Leach, Malac., p. 25; Milne Edwards Hist. des Crust., vol. ii, p. 129.*

Bell says, "The male of this species so nearly resembles that of *E. bryerii* that without careful examination they may readily be mistaken for each other. The principal distinctive characters are to be found in the form and proportions of the antennæ, and the size of the granulations on the surface."

This is the most rare of the British species of *Ebalia*. It was discovered by the indefatigable and unfortunate Mr. Cranch in Plymouth Sound, where, according to Leach, it was afterwards observed in considerable numbers.

**EBALIA PENNANTII**—Pennant's Ebalia.—*Leach, Malac. Brit., pl. 25; Milne Edwards, Hist. des Crust., vol. 2, p. 129; Pennant, pl. 9, fig. 19.*

This species ranges from Shetland to the coast of Cornwall.

GENUS, ATELECYCLUS.—*Leach.*

"Carapace large, circular, arched anteriorly, more contracted behind. Cavities of the eyes longitudinal, front denticulated."

**ATELECYCLUS HETERODON**—Circular Crab.—*Leach, Malac. Brit., t ii; Milne Edwards, Hist. des Crust., t 2, p. 143.*

"Common in the stomachs of fishes, chiefly Cod fishes and common Rays, from the depth of 20 to 50 fathoms. They must abound at these depths, as I have found more than thirty in a single fish, and almost every Ray opened for several days in succession was found to contain them."

It has been recorded from the north of Scotland, and on the Irish coast.

GENUS, CORYSTES.

Carapace longer than broad, and in shape approaching an ellipse. Outer antennæ very long, and inserted in a cavity of the orbitary foramen.

**CORYSTES CASSIVELAUNUS**—Long Crab—*Couch.*—Masked Crab—*Bell, Leach, Malac. Brit., p. 1.*

*Corystes Dentatus*.—*Milne Edwards, Hist. des Crust., vol. 2, p. 148; Couch, Cornish Fauna, p. 74.*

*Cancer Cassivilanus*—*Pennant, pl. 7. C. Personatus, of some writers.*

It is common on sandy shores at low water, "where it burrows in the sand, leaving the extremities of the antennæ alone projecting above the surface. These organs are of some use beyond their common office of feelers, perhaps as in some others, they assist in the process of excavation; and when soiled by labour, I have seen the Crab effect their cleaning by alternately bending the joints of these stalks, which stand conveniently angular for this purpose. Each of the long antennæ is thus drawn along the brush that fringes the internal face of the other, until both are cleared of every particle that adhered to them."

The animal received its synonym of Masked Crab from the representation of a human face impressed upon its carapace.

#### ANOMURA.—(SOFT-TAILED CRABS.)

The genera of this group are distinguished from the *Brachyura* by the length of the pleon or tail, many of which from occupying shells of molluscs and other situations have no hard or crustaceous covering, hence their name. But the whole group or sub-order are recognized by having the fifth and sometimes the fourth pair of legs feeble and small.

#### PAGURIDÆ.

##### GENUS, PAGURUS.

"The abdomen (pleon) large and membranous, turned sideways; the pairs of the abdominal feelers irregular."

PAGURUS BERNHARDUS.—*Linn.; Milne Edwards, Hist. des Crust. t. ij, p. 215; Bell, Brit. Stalk-eyed Crust., p. 171.*

*P. Streblonyx*—*Leach, Malac. Brit. p. 26; Pennant, pl. 17.*

"Common and abundant, the smaller in pools left by the tide, the larger in a considerable depth of water; where they become so large as to occupy Whelk shells (*Buccinum*) of the largest size. As Crabs of this genus are weak and defenceless in the hinder parts of the body, they exercise the well known habit of residing

in the empty shells of various species of the turbinated mollusca, moving about in this way from an early stage of their existence as if the structure were a portion of their own bodies.

They cannot, indeed, be easily induced to quit their habitation, but shrink into it on the least appearance of danger, so that the usual way in which they fall victims to an enemy is when the shell and its inhabitants are swallowed together. Few crustaceans are more frequently found in the stomachs of fishes, and as they quit the shell when about to die, they soon become the food of their devourer, the empty shell being speedily rejected from the mouth. These crustaceans also quit their assumed tabernacle from increase of size, which as in others, is at the time of exuviation; and on one occasion, when I was observing the combat of a pair in captivity, the smaller, which seemed to have felt itself fettered by its unwieldy covering, quitted the encumbrance, and manœvered round the enemy with great alacrity in its naked condition. They often seize the fishermen's bait, and are drawn up from deep water by the line; and in feeding I have seen them hold their prey with the smaller (or left) hand, whilst the other was engaged in nipping off pieces and conveying them to the mouth. They breed when of small size, the pea being thrown round on the back, from which position it is certain that they must quit the shell in order to deposit it."

This last statement is corrected by the fact that Crustacea never deposit their spawn, but the young are hatched from the egg and are thrown out of the shell by the current of water that passes out of the shell during the process of respiration. I have seen them ejected through the branchial passage under the wing of the carapace.

Mr. W. A. Lloyd, who was formerly curator of the Hamburg aquarium, informed me that in the spring of the year in the aquarium he had seen the male of this crab take hold of the shell in which a female was contained, and carry her about for weeks together, grasping the thin edge of the shell, and when the female was fed the male did not take away the food as he would if a male one fed in his vicinity.

In the Zoologist for July 1871, pp. 26-85, Mr. Gurney states that he found in one of the capsules of a group of eggs of *Buccinum*, that had been discharged, a little whelk shell not larger than No. 5 shot, occupied by a young Hermit crab about an

eighth of an inch in length, and in another capsule a second hermit crab of similar size, but not ensconced in a shell.

This crab is very generally distributed on European coasts.

PAGURUS PRIDEAUXII (Prideaux's Hermit Crab).—*Leach, Malac., Brit. t. xxvi, pp. 5, 6; Milne Edwards, Hist. des Crust., t. ii p. 255; Bell, Hist. Brit. Stalk-Eyed Crust., p. 175.*

“More scarce than the last.

“I have examined a specimen with a line of hairs encompassing the thorax (pereion), with a few rather long fibres also pointing forwards from the first segment of the abdomen (pleon); but further observation is necessary to decide whether it be a distinct species.”

This species was first taken by Prideaux, in Plymouth Sound. Since then it has been found on many parts of the coast.

It is frequently found associated with a sea anemone on its shell, (*Adamsia maculata*.) It is not unfrequently associated also with a nereid annelid and an amphipodous crustacean. I have seen the annelid come out of the shell when the crab was feeding and steal his food from him.

PAGURUS CUANENSIS.—*Thompson; Bell, Stalk-Eyed Crust., p. 178.*

Dredged off the coast in Whitsand Bay, near Plymouth. C.S.B.

*Report of Dredging Committee British Association, 1868.* First found in Ireland by Thompson. *Report Brit. Assoc., 1843, p. 267.*

PAGURUS ULIDIANUS.—*Thompson, Rep. Brit. Assoc., 1843 p. 257; Bell, Stalk-Eyed Crust., p. 180.*

Off Plymouth. C.S.B. *Rep. Brit. Assoc.*

I have little doubt but that the suggestion of Professor Bell is correct, and that *P. ulidianus* is the young of some other species, probably *P. Bernhardus*.

PAGURUS HYNDMANII.—*Thompson, Rep. Brit. Assoc., 1843, p. 267; Bell, Stalk-Eyed Crust., p. 180.*

*P. fasciatus*.—*Bell, p. 374.*

Plymouth, dredge, near the White Buoy, by Mr. Boswarva.

*Pagurus fasciatus* is evidently this species also.

PAGURUS LÆVIS.—*Thompson, Rep. Brit. Assoc., 1843, p. 267; Bell, Stalk-Eyed Crust., p. 184.*

Taken in a trawl near the Eddystone. C.S.B.

PAGURUS DILLWYNII.—*Spence Bate, Ann. Nat. Hist., 1851, p. 320, pl. X, fig. II. Bell, Stalk-Eyed Crust., p. 377.*

Dredged off Plymouth. C.S.B.

This species was first found in South Wales, several years ago, and no naturalist appears to have met with it since. In the summer of 1865 I again met with it in tolerable abundance. I took it with a dredge off the entrance to Plymouth Sound, and seeing it with a number of shrimps in the basket of a fish woman, at Teignmouth, I purchased the entire stock, and hastening to the beach, there, with the incoming tide I took many specimens, which I kept alive. This, the prettiest of all the pretty genus, has the habit of burrowing in the sand, and it is probably to this circumstance that it has not been met with more frequently.

An interesting point in the development of this animal I have been enabled to make out and publish in the Report on the Marine Fauna and Flora of South Devon and Cornwall, presented to the British Association for 1865. Early in June we were enabled to capture many specimens of the young animal in various degrees of progressive growth, a circumstance that has enabled us to declare that the genus *Glaucothoe* described by Mr. Milne Edwards in the *Annales Sci. Nat.*, for March, 1830, *Prophylax* of Latrielle, is none other than an immature stage of *Pagurus*; at this period the little creature swims freely in the ocean, and so continues until obliged by an increase of growth to take refuge in a shell, when he settles down and becomes a Hermit crab.

### PORCELLANADÆ.

GENUS, PORCELLANA.—*Lamarch.*

"Carapace nearly circular; hands broad and twisted; the hinder pair of legs slight and weak, bent on the other, and ending with a finger. The abdomen (pleon) bent under as in *Brachyurus*, but ending in a fan-shaped tail."

PORCELLANA PLATYCHELES (Hairy Crab).—*Milne Edwards, Hist. des Crust.*, t. ii, p. 255; *Pennant*, p. 6, fig. 12; *Bell, Stalk-Eyed Crust.*, p. 190.

"Abundant under stones at low water mark. It is incapable of moving in any direction except backwards, not lifting its claws, but drawing them after it; the antennæ lying on the sides of the carapace in the direction of its march. Unlike our other crabs, it does not wait for an attack to throw off its legs; but siezing an enemy with its nippers, it leaves them to do all the injury of which they are capable, whilst itself has retreated to a place of safety."

Its geographical range is from the Orkneys, where it reaches; its largest size, to the Mediterranean. On our coast it ranges from the shore to about three fathoms of water, and is very common.

*PORCELLANA LONGICORNIS*.—*Pennant*, *pl.* 1, *fig.* 2.

*Pisidia longicornis*.—*Leach*, *Dict. des. sc. nat.*, *xviii*, *p.* 54 (*not Malac. Brit.*); *Milne Edwards*, *Hist. des. Crust.*, *Vol.* 2, *p.* 257; *Bell*, *Stalk-Eyed Crust.*, *p.* 193.

*Porcellana Leachii*.—*Gray*, *Zool. Miscel.*, *p.* 15; *Couch*, *Cornish Fauna*, *p.* 76.

Common on zoophytic and rocky ground, from one to forty fathoms of water. It seldom frequents the shore above half-tide.

I think that there can be little doubt but that Mr. Bell is correct in his opinion that *Porcellana acanthocheles* of Couch's previous Cornish Fauna is but a young specimen of this species.

### *GALATHIADÆ.*

GENUS, *GALATHEA*.—*Fabr.*

"Carapace covered with transverse sections edged with short hair; snout (rostrum) advanced and spirey; half of the abdomen (pleon) permanently bent under."

Carapace depressed; anterior pair of legs chelate, equal, flat, long; posterior pair feeble, unfit for walking; abdomen (pleon) broad, flat; posterior pair of pleopoda (tail) broad, flat; telson wide.

*GALATHEA STRIGOSA* (Plated Lobster); *Linn.*

*G. spinigera*.—*Leach*, *Malac.*, *pl.* 28; *Pennant*, *pl.* 14, *p.* 26 *Milne Edwards*, *Hist. des. Crust.*, *t.* 2, *p.* 323; *Bell*, *Stalk-Eyed Crust.*, *p.* 200.

"Common, and in its younger state not easily distinguished from *G. squamosa*. It is incapable of any motion but backward, and rarely rises above the bottom, when by a laborious motion of its tail it continues to retreat from its enemies; and its usual progress is creeping, and by its legs only."

Mr. Couch's observations must have been on the sea-shore when the animal is out of the water. In the sea, *Galathea* as well as *Porcellana*, having the power of swimming very rapidly, and this they do mostly with the power of the whole tail (or pleon.)

*GALATHEA SQUAMOSA* (Scaly Galathea, *Bell.*)—*Leach, Malac, pl.* 28; *Milne Edwards, Hist. des Crust., t. ii, p. 975, Bell, Stalk-Eyed Crust, p. 197.*

Common under stones at low water.

This species is not so frequent as *G. strigosa*, and frequents deeper water, ranging, according to our experience, to 12 fathoms.

*GALATHEA NEXA*.—*Embleton, proc., Berwickshire Club; Bell, Stalk-Eyed Crust., p. 204.*

We have taken this specimen off the Cornish coast in forty fathoms of water. It has been taken at Zetland and in Ireland.

*GALATHEA DISPERSA*.—*Spence Bate; Proc. Linnean Society.*

This is a smaller species than the two preceding, and is among our commonest form beyond low water.

*GALATHEA ANDREWSII*.—*Kinahan, Dublin Nat. Hist. Soc.*

This species was first found off the coast of Cornwall, but described by Prof. Kinahan from a female taken in Dublin Bay. It has since been described by Mr. Spence Bate, from a male taken off the Cornish coast. The male differing from the female in having a much longer pair of chelate limbs.

This species is tolerably frequent on the zoophytic ground from 10 to 50 fathoms, and the female is apparently much more abundant than the male.

It is perhaps the smallest species of our local forms.

*GALATHEA BAMFFICA*.—*Pennant, Brit. Zool., iv, t. iii.*

*Munida rugosa*.—*Leach, Dict. des sc: Nat., xviii, p. 52.*

*Galathea bamfia*.—*Leach, Edin. Encyc., vii, p. 398.*

*Munida rondellii*.—*Bell, Stalk-Eyed Crust., p. 208.*

I have taken this species, which is rare on the stony ground, in from 20 to 30 fathoms off the Dudman.

Mr. Couch says that it is common in the stomachs of codfish. Bell in writing on the species says that it is far from common, and was found by Mr. Prideaux in Plymouth Sound, and he also received it from Falmouth, where it was taken by the late Dr. Cocks: and it is somewhat remarkable that it has not found a place in Mr. Couch's list of Cornish Crustacea. It is recorded from Zetland and Ireland, and it is worthy of note that while



extending as far as the Shetlands from whence I have received it, the specimens that have been dredged in the colder regions are very small, and the inhabitants of very deep water.

*GALATHEA DIGIDISTANS*.—*Spence Bate, Report on the South Devon and Cornwall Marine Fauna Flora; Brit. Assoc. Report, 1867, p. 277 and 279.*

In that report the author says, "among the *Galathea* that we have taken on our coast, and which embrace all that have been previously known as British, is one that we think must be accepted as not having been previously described. The largest specimen measuring from the extremity of the tail to that of the extended hands is little more than two inches, of which the animal itself, measuring from the extremity of the rostrum to that of the tail, is little more than one inch. This species differs from either of the others in having the large pair of chelate pereiopoda (hands) flat and broad, the fingers much curved, very distant, and meeting only at their apex when closed, furnished on the inside with a considerable brush of hairs, and armed near the base of the moveable finger with a prominent tubercle or tooth, but which appears to be of little importance, since it is not able to impinge against the opposite finger.

We have sometimes thought that this specimen may only be an extreme form of the male of *Galathea squamifera*; but the armature of the surface of the hands, which is generally a safe guide to specific characters, has a distinct variation. In *G. squamifera* the arms are covered generally with a series of curved scale-like tuberculations, the anterior margin of which is divided into a series of bead-like elevations, while in the most typical parts such as on the surface of the *meros* and *carpus* the central prominence is elevated to a point, and the whole of the tubercular ridge is crowned by a row of short hairs, so minute that they are not perceptible except by the assistance of a lens. These tuberculations are closely packed and regular.

In this species the tuberculations are less prominent and defined, the margins of which can only be perceived to be at all baccated by careful arrangement of light, while the cilia, being far less numerous, are yet more conspicuous under the lens."

Two specimens only have been taken on stony bottom, in 30 fathoms of water.



## MACRURA—(LONG-TAILED DIVISION).

## SCYLLARIDÆ.

GENUS, SCYLLARUS—*Fabr.*

Second pair of antennæ having a broad disc-like plate instead of an extended rod-like flageller.

SCYLLARUS ARCTUS.—*Linn.* ; *Milne Edwards, Hist. des Crust., t. ij, p. 282.*

Several specimens of this very interesting animal have been taken of late, one of which was at Polperro, and Mr. Couch had the honour of announcing its first addition to the British fauna. Since then it has been taken by Mr. Cornish at Penzance, and at Plymouth near the entrance of the Sound. Two of these were pregnant with spawn. Two also were taken in the stomach of a cod fish. Those that I have seen were about four inches long. The zoea of Scyllarus, according to Anton Dhorn are Phyllosoma.

## PALINURIDÆ.

GENUS, PALINURUS.—*Fabr.*

"The body almost cylindrical, in front a deep impression, having on each side a prominent spine with others scattered about. The legs compressed, all monodactyle."

PALINURUS VULGARIS—(Crawfish, or Red Crab)—*Couch* ; *Leach* ; *Fabr* ; *Milne Edwards, Hist. des Crust., t. ii, p. 292* ; *Leach, Malac., pl. 30.*

Cancer Homarus.—*Pennant, pl. 11, fig. 22* ; *Bell, Stalk-Eyed Crust., p. 213.*

"A large and valuable species, inhabiting along the borders of rocks, where it is often taken in crab-pots, which, however, its long and unyielding antennæ frequently hinder it from entering. Keeping in companies, it also gets entangled in the trammel net, and in some abundance on the fishermen's lines. It meets a ready sale in the market, though not so highly esteemed for the table as the lobster."

It appears to be more general on our western coasts than elsewhere. They are rare in the north, both in England and Ireland.

The young or zoea of this species was first made known by Mr. R. Q. Couch, son of the author of the Cornish Fauna, at the meeting of the British Association at Dublin, 1857.

Its peculiar form, and the failure up to the present time, of tracing the animal through all its stages of development, makes it an object of interest; and I think it worthy of consideration, particularly by those who, as a crucial test in the theory of evolution, demand the exposition of a series of successional forms of life. They should remember that of this animal so common on our coast and in our markets, that there is no one yet who has been able to determine the several forms through which this animal passes in its growth from the zœa to the adult stage. Its first form is that known as *Phyllosoma*, its next stage is, I believe, that known as the genus *Amphion*, but this is only conjecture, as it has not been traced or clearly determined beyond the form the young quits the ovum. How, therefore, if a common form like this Crawfish cannot be traced from one end of its life to another, can we expect that the record of many forms of lost animals can be made perfect?

The young quit the ovum mostly at the same time, and Mr. A. Lloyd tells me that in the aquarium they suspend in the water for a day or so like a monster cone-like cloud, after which they disperse and die.

### THALASINIDÆ.

GENUS, *CALLIANASSA*.—*Leach*.

"The integuments, except of the claw, less, soft; caudal plates large and foliaceous; first pair of legs didactyle, unequal; second pair small, didactyle;" third pair not didactyle. Carapace with rostrum.

*CALLIANASSA SUBTERRANEA*.—Burrowing Shrimp —*Leach, Malac. Brit. t. xxxii; Milne Edwards, Hist. des Crust., vol. ii, p. 3 and 9.*

Montague first took this species, probably, in Kingsbridge river; I took it many years since in company with the late Professor Kinahan, in Plymouth Sound. Mr. Couch makes no remark about it, or says where it was taken, but most probably off Polperro, but as it is a burrower it probably escapes observation.

GENUS, *AXIUS*.—*Leach*.

"Integuments moderately firm; caudal plates large and foliaceous. First pair of legs chelate, unequal; second pair chelate, subequal; the following pairs not didactyle. Carapace with a small triangular rostrum."

**AXIUS STIRYNCHUS.**—*Leach, Malac. Brit. t. 33; Milne Edwards, Hist. des Crust., t. ii, p. 311; Bell, Stalk-Eyed Crust., p. 228.*

“The male of what I (Mr Couch) judge to be the same species, differs from the female in the snout (rostrum), which in my specimen of the latter was finely notched, and without the well marked longitudinal ridge of the former. The outer antennæ of the male are furnished with a ridge of fine hair on their inward line decreasing towards the point, which the female is without; and the former also has well-marked brushes near the lateral edges of the abdominal rings. This specimen, like those of the Genus *Callianassa*, has the habit of burrowing in the sand, from which it rarely emerges; and then it seeks shelter in a crevice covered with weeds, for it is sluggish in its motions, and if distant from a soft bottom in which to sink, incapable of escaping an enemy. A female that I obtained loaded with spawn, was dug out of sand in the middle of summer.

In the *Zoologist* for 1856, page 5282, Mr. Couch figured and described a specimen that appears to differ from this only in the more equal size of the two great chelæ, and this might have been due to a loss of one of the limbs and its gradual reconstruction.

#### GENUS, *GEBIA*.—*Leach.*

“Carapace terminating in a rostrum large enough to conceal the eyes, the sides forming a ridge passing back and encircling the region of the stomach. Outer antennæ without a scale. Abdomen (Pleon) long, more enlarged behind; caudal plates large. The claw legs straightened, the moveable finger large, but not met by a corresponding portion in opposition. The following legs one fingered, those of the second pair having the next to the last articulation large and ciliated.”

**GEBIA STELLATA.**—*Montagu; Leach, Malac., t. 31; Milne Edwards, Hist. des Crust., t. ii, p. 313; Bell, Stalk-Eyed Crust., p. 223.*

The habits of this animal is similar to that of *Callianassa*, in whose company it has been taken. Dr. Leach says that it has been taken in Plymouth Sound under the mud, in which it makes long winding horizontal passages, often a hundred feet or more in length.

**GEBIA DELTURA.**—*Leach, Malac., t. 31; Milne Edwards, Hist. des Crust., t. ii, p. 214; Bell, Stalk-Eyed Crust., p. 228.*

"I (Mr. Couch) find what appears to me to be this species in abundance in the Ray fishes (*Raia maculata* and *R. Clavata*), caught in from 30 to 50 fathoms of water."

### *ASTACIDÆ.*

GENUS, HOMARUS.—*Edwards.*

"Rostrum, and with a few spines on each side; scale of the outer antennæ very small, and like a tooth." First pair of limbs chelate, hands large, ovate compressed; second and third pair small, chelate; fourth and fifth simple.

HOMARUS MARINUS.—*Fabr.*

*Astacus marinus.*—*Pennant; Fabr.*

*Homarus vulgaris*—*Milne Edwards, Hist. des Crust., t. ii, p. 334; Couch, Cornish Fauna, p. 78.*

"Lobsters are very common among the borders of not very elevated rocks, from close to the shore to the depth of about 20 fathoms. It is certain that they are less abundant at present than about the beginning of the present century; for whilst now, with a hundred pots, a dozen a day is regarded as tolerable success, persons now living have caught about a hundred in the same space, and in one instance a hundred and forty seven. One fisherman has taken 640 in a week, where now another has secured only 300 in a season. The reason assigned for this falling off is that the fishery for congers is not followed as formerly, and it is certain that this fish feeds eagerly on them. Perhaps, however, too little is ascribed to the increased demand in the market, and the consequent extension of the fishery, for the number of edible crabs has also diminished within the few years that an advanced price has been obtained for them. On the coast of Scotland, where it does not appear that fishes likely to destroy them are less abundant than with us, lobsters are in great multitudes, for Sir William Jardine informs us that at Montrose from 60,000 to 70,000 are annually sent to London, at the rate of 2½d. for each lobster."

"Lobsters do not wander much from their accustomed haunts, and hence the discovery of a new station is a fortunate circumstance for the fisherman; and each situation is found to impress its own shade of colour on the shell. The same means are employed in fishing for lobsters as for crabs; but whilst the crab prefers bait

perfectly fresh, the lobster is attracted by that which is hung up to become tainted, or has been preserved by salting. Some other particulars of this fishery are given when speaking of the common crab."

Upon the authority of Mr. J. E. Saunders, the respectable fish salesman of Thames-street, Mr. Bell says, that often during the season the supply at Billingsgate is not less than 20,000 to 25,000 lobsters in one day. Most of these come from Norway, from whence the supply is not less than 600,000. It is computed, moreover, that not less than 150,000 reach London from Scotland and the neighbouring islands.

During the Commission which has recently been held in Devon and Cornwall, it is quite clear that the apparent scarcity is due to the increased number of fishermen, and the division of the produce of the fishery among so many.

Still, however, from increasing population, the demand is gradually becoming greater than the supply. It would therefore be desirable as much as possible to discourage the destruction of lobsters while bearing spawn. The loss of one lobster in berry is the destruction of some 60,000 to 100,000 young animals of the same kind.

In Bell's Crustacea I observe that he is indebted to Mr. Couch for the following paragraph—speaking of the opinion that the antennæ are thrown off at will or from injury,—I have not found this to be the fact; but subjecting the parts to blows or fracture, both in short and long-tailed crustacea, I have found the creature suffering acutely from the injury, most so when just emerged from the water; but in no case have they rejected the whole organ in consequence of the violence. If, however, it be violently handled, a separation takes place at the terminal joint of the peduncles in preference to any other place; and from this wound no stream of blood flows, but a fine membrane quickly forms on the surface, by which all effusion is prevented."

When the antennæ is reproduced it is curved in a spiral form within a saccular case, and becomes extended when the animal throws off its external covering in the next natural period of moulting.

On the same animal Mr. Bell gives the following statement on the authority of Mr. Peach:—

"I have heard the fishermen of Gorran Haven say that they have seen in the summer, *frequently*, the old lobsters with their young ones around them; some of the young have been noticed as six inches long. One man noticed the old lobster with her head peeping out from under a rock, the young ones playing around her; she appeared to rattle her claws on the approach of the fisherman, and herself and young took shelter under the rock; this rattling, no doubt, was to give the alarm. I have heard this from several, some very old men, who all speak to this without concert, and as a matter of course; and they are men I can readily believe."

GENUS, CRANGON,—*Fabr.*

"Carapace somewhat depressed, with only the rudiment of a rostrum; antennæ inserted on about the same transverse line, on the outer side a large scale. The claw legs expanded, the moveable finger opposed to a slight rudiment of a process." (Subchelate).

CRANGON VULGARIS—Sand Shrimp.—*Fabricius*; *Milne Edwards*, *Hist. des Crust.*, t. ii, p. 341; *Leach*, *Malac.*, pl. xxxvii; *Bell*, *Stalk-Eyed*, 256; *Astacus crangon*, pl. 15, fig. 30.

"Common in harbours on a sandy bottom, in which it buries itself, an operation performed by the aid of the hinder legs, but it heaps the loose sand on itself by the action of the antennæ."

CRANGON SPINOSUS.—*Leach*; *Bell*, p. 261.

Crangon cataphractus.—*Edwards*, *Hist. des Crust.*, t. ii, p. 243; *Couch*, *Cornish Fauna*, p. 79.

Pontophilus spinosus.—*Leach*, *Malac.*, pl. xxxvii A.

One specimen only was obtained by Mr. Couch, and that came from the stomach of a fish taken at a depth of from 12 to 15 fathoms. We have taken it frequently among the Zoophytes from six to sixteen fathoms of water.

CRANGON BOREAS—Arctic Shrimp.—*Phipps*.

Crangon fasciatus.—*Risso*, *Crust. de Nice*, t. iii, fo. p. 83; *Edwards*, *Hist. des Crust.*, t. ii, p. 324; *Bell*, *Stalk-Eyed Crust.*, p. 259.

Crangon sculptus.—*Bell*, *Stalk-Eyed Crust.*, p. 263.

There can be little doubt but that *C. fasciatus* and *C. sculptus* are identical with *C. boreas* of Phipps. I have compared the animals with the description and figures of the respective authors, and

feel sure that the variations between the several forms are dependant upon habitat. Those of the Arctic and more northern forms having the spines more strongly developed.

Found occasionally on stony ground in about 20 fathoms of water.

CRANGON TRISPINOSUS.—Three-spined shrimp.—*Bell, Stalk-eyed Crust.*, p. 265.

Pontophilus trispinosus.—*Hailstone, Mag. Nat. Hist.* viii. p. 261, fig. 25.

I have taken four specimens of this species in Bigbury bay, on the north coast of Devon. Strictly this is not Cornish, but I can hardly imagine that an animal can be found as near, and yet not existing on the coast of Cornwall, the conditions being so similar.

#### GENUS, NIKA.—*Risso.*

First pair of antennæ two branched; first pair of legs dissimilar, one chelate, the other simple; second pair long multi articulate, minutely chelate.

NIKA EDULIS.—*Risso, Crust. de Nice*, p. 85; *Bell, Stalk-Eyed Crust.*, p. 275; *Edwards, Hist. des. Crust.*, t. ii, p. 364.

We have taken it occasionally on stony ground in about 30 fathoms of water.

NIKA COUCHII.—*Bell, Stalk-Eyed Crust.*, p. 278.

We have taken this in the same locality as the other.

With all due deference to the ability and a cute observation of the author of the work cited, I must insist that this is nothing more than a variety of *N. Edulis*. It was first found by Mr. Couch and sent to Professor Bell, who never saw but this one specimen.

#### GENUS, AUTONOMEA.

"Eyes on short footstalks, projecting from beneath the border of the carapace. The snout scarcely passing beyond the eyes. The inner antennae double, one filament much longer than the other. Outer antennæ slender, and much longer than the body, first pair of hands only with fingers."

AUTONOMEA OLIVII.—*Milne Edwards, Hist. des Crust.*, t. ii, p. 361.

"This species has been hitherto unknown as British, but I have examined several specimens taken from the stomachs of fishes, from the depth of 15 or 20 fathoms. Some of these were of



larger size than described from the Mediterranean. One, not the largest measuring three inches from snout to tail, with antennæ of the length of five inches."

This species has not been noticed in *Bell's Crustacea*.

### ALPHEADÆ.

GENUS, ALPHEUS.—*Edwards*.

Carapace covering the eyes. Second pair of antennæ having two branches. First pair of legs being large, chelate. Second pair long, slender, multarticulate, minutely chelate. Three posterior pairs simple.

From the manner in which the anterior margin of the carapace covers the eye, it is evident that all the members of this genus dwell under the surface of the sea bottom.

ALPHEUS RUBER.—*Edwards, Hist. des Crust., t. ii, p. 231; Bell, Stalk-eyed Crust., p. 271.*

The late Dr. Cocks, of Falmouth, took the first specimen of this species on our coast, as recorded by *Bell*. It has since been taken off the Dodman in thirty fathoms of water. Also in Plymouth sound. Its more general habitat is on stony ground in about thirty fathoms of water.

Its colour, salmon, and red at the joints.

ALPHEUS EDWARDSII.—We have taken several specimens of this species off the Dodman on stony ground, in about 30 fathoms of water.

I am inclined to believe that the habitat was shallower than recorded.

GENUS, TYPTON.—*Costa*.

„ Pontonella.—*Heller*.

Eyes exposed beyond the carapace. First pair of legs equal slender, long, chelate. Second pair large, unequal, chelate.

TYPTON SPONGIOSUM.—*Spence Bate. Report of Devon and Cornish Fauna, Brit. Assoc., 1867, p. 283.*

Several specimens of this species were found inhabiting a sponge in about four fathoms of water, on stony ground off Plymouth sound.

*The Rd. Merle Norman, Annals, Nat, Hist.,* considers this species to be identical with *Costa's* species from the Mediterranean.



GENUS, HIPPOLYTE.—*Leach*.

“Carapace inflated on the top, rostrum large, compressed, toothed. First pair of antennæ with two branches. First pair of legs chelate, equal, short; second pair long, unequal, multarticulate minutely chelate.

HIPPOLYTE CRANCHII.—*Leach, Malac. t. xxxviii, fig. 13,—21; M. Edwards, Hist. des Crust., t. ii, p. 367; Bell, Stalk-eyed Crust., p. 288.*

“Common in crab boats, and consequently living where the fishing is carried on for lobsters.”

This species appears to exist all round the island, and is common on stony ground, in from 6 to 10 fathoms of water.

GENUS, CARADINA.—*Edwards*.

Like Hippolyte, but having the first pair of legs chelate, and more robust. The *propodos* or hand articulating with the *carpus* or wrist by the inferior angle only.

CARADINA VARIANS.—*Spence Bate, Brit. Assoc., Sept. 1865, p. 53.*

Hippolyte varians.—*Leach, Malac., p. 38; Edwards, Hist. des Crust., t. ii., p. 371; Bell, Stalk-eyed Crust., p. 286.*

This was long classed among the Hippolytes, but it undoubtedly belongs to this genus. Not uncommon in Plymouth sound. *Dr. Leach* says that it is abundant in pools amongst the rocks on the south-western coast of Devon and Cornwall, and it is curious that it is not mentioned in *Mr. Couch's Cornish Fauna* for 1857, as it is one of the most common species on the shore.

CARADINA TENUIROSTRA.—*Spence Bate, Rep. Brit. Assoc., 1867, p. 278; Ann. Nat. Hist. (Carcinological Gleanings) 1865,*

Several specimens taken in Plymouth sound in from 4 to 6 fathoms of water.

## GENUS, PANDALUS.

First pair of antennæ two branched. First pair of legs simple; second pair, slender, unequal in length, multarticulate, minutely chelate.

PANDALUS ANNULICORNUS.—*Leach, Malac. Brit. t. xi; Edwards, Hist., des Crust., t. ii, p. 384; Bell, Stalk-eyed Crust., p. 297.*

"Common in crab boats. There appears to be two other species on our coasts which I have been accustomed to call *Æsop's Shrimps*, from their habit of bending up the back into a hump, but further observation is necessary to decide whether they are known to naturalists."

One of these is the following.

PANDALUS THOMPSONI.—*Bell, Stalk-eyed Crust*, p. 290.

*Pandalus Jeffreysii*.—*Spencee Bate, Ann. Nat. Hist., and Brit. Assoc. Rep.*, 1867, p. 278.

Occasionally on rocky ground in about 6 fathoms of water.

GENUS, PALÆMON.—*Fabr.*

"Carapace elongated into a serrated rostrum of considerable length." First pair of antennæ on three branches. First pair of legs small, slender, chelate; second pair larger and chelate.

PALÆMON SERRATUS.—Common Prawn.—*Pennant; Leach, Malac*, pl. 48; *Milne Edwards, Hist. des Crust.*, t. ii, p. 389; *Bell, Stalk-eyed Crust.*, p. 302.

"A common species, found of largest size on the rockiest coasts, where it seeks the shelter of large stones and places overhung with weeds. It prefers the stillest waters, advancing and retiring with the tide; in summer preferring water that has a distinct feeling of warmth, and in winter going into what is, at that season, less cold than at the margin, but never far from land."

"It is sought after as a delicacy, the usual method of taking it is with a bag net suspended from a circular ring of iron at the end of a pole. Another method is by small pots, resembling those employed for the Crab and Lobster. The Prawn is a tempting bait for most sea fish."

It inhabit all our coasts from about forty fathoms.

PALÆMON SQUILLA.—*Linn., Fabr.; Leach, Malac*, pl. 43; *Milne Edwards, Hist. des Crust.*, t. ii, p. 300; *Bell, Stalk-eyed Crust*, p. 305.

"Scarce, and generally confounded with the last named species." According to *Leach* it is tolerably abundant on the coast of Devon.

## GROUP STOMAPODA.

## MYSIDÆ.

GENUS, MYSIS.—*Lats.*

Legs terminating in a multarticulate extremity supporting a second multarticulate branch attached to the "coxa," or first joint. Female carrying the ova beneath the body in a pouch.

MYSIS CHAMELEON.—(Opossum Shrimp).—*V. Thompson, Zool. Research, p. 27; Milne Edwards, Hist. des Crust., t. ii, p. 457.*

M. Spinulous.—*Couch's Cornish Fauna, p. 80.*

"Common in summer, when it draws near the shallows from deep water. It also enters rivers in multitudes, forming a long line of migrations, at which season it is much devoured by the trout. Its English name is taken from its habit of carrying the eggs in a receptacle under the body, until they are hatched, as in the analogous genus of quadrupeds, the opossum tribe.

There are other species as well as the nearly allied genus *Cynthia* on our coast, but they are here omitted for want of a recent opportunity for comparison.

MYSIS GRIFFITHSIÆ.—*Bell, Stalk-eyed Crust, p. 342.*

We have taken this supposed species, but I feel assured that it is only the younger stage of a macrurous form, probably *Palemon* or *Crangon*, the young of either genus of which it closely approximates.

## GENUS, THYSANAPODA.

Branchia external and pendulous, branched, legs having the secondary branch short.

THYSANAPODA COUCHII.—*Bell, Stalk-eyed Crust, p. 346.*

This species was described by Professor Bell from specimens sent to him by "Mr. Couch, who obtained them from the Cornish coast from the stomach of a mackerel, which appeared to have been making a feast of this rare and interesting little crustacea." The author adds "The following account has been kindly furnished me by that gentleman, and shows that it can scarcely be considered as an ordinary inhabitant of our coasts. "The mackerel from which the curious shrimps *Thysanopoda* were taken, were caught almost at mid-channel, or almost ten leagues from us, perhaps seven or eight south of the Lizard; and I have not seen any since, although I am much in the habit of search-

ing the stomach of mackerel and other fishes. There were myriads in the stomachs of the mackerel at the time when I obtained those I sent you." As a mark of esteem Professor Bell "dedicated the species to that indefatigable and acute observer to whom we are indebted for so many valuable contributions to natural science."

We have since procured specimens near the coast, but only one or two.

### SQUILLADÆ.

#### GENUS, SQUILLA.

Carapace reduced in size, covering only half the Pereion (body), second pair or gnathopoda (outer maxilliped or footjaws, of authors), large sub-chelate. First three pair of legs (pereionopoda) small, sub-chelate. Posterior three pairs only five joints, third joint carrying a second branch. Pleon large.

SQUILLA MANTES.—Rondel.—*Bell, Stalk-eyed Crust*, p. 351.

This species was taken first by Mr. Couch on the coast of Cornwall, and Professor Bell is indebted to him for a knowledge of it. It was found "about two leagues off, where the bottom is rocky with spots of sand."

SQUILLA DESMARESTII.—*Risso; Edwards; Bell, Stalk-eyed Crust*, p. 354.

Mr. Couch in his Cornish Fauna of 1868 records this species as rare, a few specimens having come into his possession, and he says that it seems to be the species alluded to by Pennant and Turton, under the name of *S. mantes*.

### GROUP CUMACEA.

#### DIASTYLIDÆ.

GENUS, DIASTYLIS.—*Say, Trans. Phil. Soc., Philad., Vol. 1.*

Carapace having the lateral angles developed anteriorly and uniting in front of the eye and antennæ, and produced to look like a split rostrum. Eyes confluent as a single organ. Tail ending with a pair of double stylets. Telson (extreme point of the tail) produced to a long sharp process.

DIASTYLIS RATHKII.—*Spence Bate, Ann. Nat. Hist, June, 1856.*

Cuma Rathkii.—*Kroyer, Voyages en Scand.*

*Alauna Rostrata*.—*Goodsir, Edin. New Phil.*, 1843.

This animal is probably to be met with in muddy bottoms all around our coast, and along the northern shores of Europe.

It was first taken in Cornwall, at St. Ives, by the late Mr. Barlee. From Falmouth I received it from Mr. Webster. I have taken it among trawl refuse off Plymouth.

GENUS, CUMA.—*Montagu*.

Carapace with the lateral angles produced in front of the confluent eye, but not produced into a rostrum like projection. Tail end with two double branched stylets. Telson absent.

CUMA SCORPIOIDES.—*Montagu, Linn. Trans. Vol. ix.*

*Cuma Audouinii*.—*Edwards, Ann. Nat. ; Goodsir ; Edin. New Phil.*; 1843.

This animal has not yet been recorded as having been found on the coast of Cornwall, but as it was first found on the south coast of Devon, also in Scotland, I cannot but believe that it must exist on this coast.

This was taken by Montagu and is the first animal of the whole group that was found.

GENUS, EUDORA.—*Spence Bate*.

Differs from *Cuma* in having the antennæ obsolete.

EUDORA TRUNCATULA.—*Spence Bate, Ann. Nat. Hist., June, 1856.*  
Plymouth sound.

## DIVISION II.

## THE SESSILE-EYED CRUSTACEA.

## AMPHIPODA.

This name was given by Latreille to this order, on account of the animals comprised in it having two kinds of appendages, one for perambulation, the other for swimming.

## ORCHESTIDÆ.

GENUS, TALITRUS.—*Latr.*

First pair of antennæ rudimentary, second long. First pair of legs strong and simple in both sexes, second pair small and feeble.

TALITRUS LOCUSTA—Sand Hopper.—*Linnaeus.*

Abundant on sandy shores above high-water mark, mostly under weed and offal. Dwelling in holes burrowed in the hot sand. In the summer they are abundant, in the winter they burrow into the sand.

GENUS, ORCHESTIA.—*Leach.*

Like Talitrus, but having the anterior two pairs of legs subchelate. The second large and powerful in the male, but slender and feeble in the female.

ORCHESTIA LITTOREA.—Shore Hopper.—*Montagu, Lin. Trans. lx. p. 9614, f. 4.*

Stony and pebbly beaches, above high-water mark. Tolerably frequent on the shores of Plymouth Sound.

ORCHESTIA MEDITERRANEA.—*Costa, Rind dell accad. Sci. nap, p. 171, 1853.*

This species has not yet been recorded from Cornwall, but it reaches from the Mediterranean and the shores of the Crimea, and the northern coast of Ireland, and also from Wales. I feel

assured that it only wants to be looked for on rocky coasts above high-water to be found.

ORCHESTIA DESHAYSI.—*Audouin, Explie. Savigny, Crust. Egypt, p. lxi., fig. 8.*

Rare. Few specimens have been taken in England, of these most have been found on the rocky parts of Plymouth Sound.

GENUS, ALLORCHESTES.—*Dana.*

Like *Orchestia*, but the first pair antennæ are longer than the peduncle of the second.

ALLORCHESTES NILSSONII.—*Rathke, Beit. zur Fauna, Norw, xx, p. 264.*

This animal may generally be found nearer the sea than *Orchestia*, and lives between high-water mark of ordinary tides and that of spring tides, in damp places, under weeds and stones.

ALLORCHESTES IMBRICATUS.—*Spence Bate.—Bate and Westwood Sessile-eyed Crust., vol. i, p. 43.*

GENUS, NICEA.—*Nicolet.*

Both pairs of antennæ short, subequal. First two pairs of legs subchelate. Telson, or extremity of the tail, deeply cleft.

NICEA LUBBOCKIANA.—*Spence Bate.—Bate and Westwood, Sessile-eyed Crust., vol. i, p. 74.*

I have received specimens of this species from Falmouth and Penzance.

GAMMARIDÆ. (STEGOCEPHALIDES.)

GENUS, MONTAGUA.—*Spence Bate.*

Antennæ subequal, first pair without a secondary appendage. First two pairs of feet subchelate.

MONTAGUA MONOCULOIDES.—*Montagu, Trans., Lin., vol. xi, pl. 11, fig. 3.*

I have received this from Falmouth, Penzance, and Plymouth.

MONTAGUA MARINA.—*Spence Bate.—Bate and Westwood, Sessile-eyed Crust., vol. 1, p. 58.*

I have found this species in the refuse of the trawlers, off the Eddystone. Mr. Edward, of Banff, has sent it to me from the

Moray Frith, and Mr. Gwyn Jeffreys has found it on the coast of Piedmont.

MONTAGUA POLLEXIANA.—*Spence Bate*.—*Bate and Westwood, Sessile-eyed Crust.*, vol. i, p. 64.

I have had this species dredged off the north coast of Cornwall, near St. Ives. I have also had it sent to me from the Shetland.

GENUS, DANAIA.—*Spence Bate*.

*Bate and Westwood, Sessile-eyed Crust.*, vol. i, p. 67.

Like *Montagua*, but first pair of legs less simple. Telson single.

DANAIA DUBIA.—*Spence Bate*.—*Bate and Westwood*, vol. i, p. 68.

Taken in trawl refuse off the Eddystone. Rare.

### LYSIANASSIDES.

GENUS, LYSIANASSA.—*Milne Edwards*.

First pair of antennæ short, thick at the base, appendiculate. First pair of legs simple, second subchelate, long, and slender. Telson single.

LYSIANASSA COSTÆ.—*Milne Edwards, Ann. des Sc. Nat.*, t. xx, p. 365.

Dredged off Plymouth.

LYSIANASSA AUDOUINIANA.—*Spence Bate*.—*Bate and Westwood*, p. 79.

I have taken this species the with dredge in Plymouth Sound.

LYSIANASSA ATLANTICA.—*Milne Edwards, Ann. des Sc. Nat.*, t. xx. Dredged in Plymouth Sound.

GENUS, ANONYX.—*Kroyer*.

Like *Lysianassa*, but with the first pair of legs subchelate. Telson single, cleft.

ANONYX EDWARDSII.—*Kroyer, Voyage en Scand.*, pl. xvi, f. 2.

This species has been taken in Plymouth Sound and Falmouth Harbour.

ANONYX HOLBOLLI.—*Kroyer, Voy. en Scand.*, pl. xv, fig. i.

This evidently is an arctic and deep-sea species. We have received it from the Haaf fishing ground, off the Shetland. Mr.



Loughrin has found it at Polperro, and I have dredged it in Plymouth Sound.

ANONYX MINUTUS.—*Kroyer, Voy. en Scand. pl. xviii, fig. 2.*

Found in Plymouth Sound and Falmouth Harbour

GENUS, CALLISOMA.—*Costa.*

Like Anonyx and Lysianassa, but having the first pair of legs slender, and not tipped with a nail. Telson double.

CALLISOMA CRENATA.—*Spence Bate—Bate and Westwood, vol. i. p. 120.*

I have only seen two or three specimens of this species. I found it first off the Eddystone, and Mr. Edwards has sent to me from Banff. Mr. Jeffreys has taken it in abundance on the Haaf fishing ground, off the Shetland.

### AMPELISCIDES.

GENUS, AMPELISCA.—*Kroyer.*

Eyes imperfect. Cephalon, or head, produced. Antennæ long and slender. First two pairs of legs slender, imperfectly subchelate. Telson squamiferous, cleft.

AMPELISCA GAIMRADII.—*Kroyer, Voy. en Scand. Crust., pl. xviii, fig. 1.*

Frequently taken in Plymouth Sound.

AMPELISCA BELLIANA.—*Spence Bate—Bate and Westwood, vol. i., p. 135.*

A northern species, but I have dredged it in Plymouth Sound.

### PHOXDES.

GENUS, PHOXUS.—*Kroyer.*

Cephalon considerably advanced in front, like a hood, eyes none, or inconspicuous. First antennæ with a secondary appendage. First two pairs of legs subchelate. Telson double.

PHOXUS SIMPLEX.—*Spence Bate—Bate and Westwood, p. 140.*

Dredged in Plymouth Sound.

PHOXUS HOLBOLLI.—*Kroyer, Tidik., vol. iv., p. 150.*

I have taken it with the dredge in Plymouth Sound, and Mr. Edward has sent it to me from Banff. I am induced to believe that this and the previous species are but sexually distinct.

GENUS, GRAYA.—*Spence Bate*.

Approaches *Phoxus*, but with the eyes large and conspicuous.  
 GRAYA IMBRICATA.—*Spence Bate*.—*Bate and Westwood*, vol. i, p. 152.

Taken in Falmouth Harbour.

GENUS, WESTWOODILLA.—*Spence Bate*.

Head (Cephalon) produced in front, eyes confluent, antennæ subequal. First pair of legs subchelate, second not so.

WESTWOODILLA CÆCULA.—*Spence Bate*.—*Bate and Westwood*, vol. i, p. 155.

Taken in the trawl off the Eddystone. Mr. Edward has sent it to me from the Moray Frith.

WESTWOODILLA HYALINA.—*Spence Bate*, *Cat. Amps. Brit Mus.*, p. 103, *pl. vii, fig. 5*.—*Bate and Westwood's Sessile Eyed Crust*, p. 158.

This species was procured from trawl refuse which had been taken near the Eddystone Lighthouse.

These two species may be only male and female. In general form they are not very dissimilar, but there is a considerable variation in the microscopical structure of the dermal tissues.

The former species *W. cæcula* is undoubtedly a female, having been taken with ova. The latter we have not determined.

GENUS, ACANTHONOTUS.—*Owen*.

*App. to Ross., Sed. voyage N.W. Passage*, p. xc.

Cephalon anteriorly produced slightly, antennæ simple, subequal. Hands feeble, subchelate. Telson single, cleft to the apex.

ACANTHONOTUS OWENII.—*Spence Bate*.—*Bate and Westwood*, p. 232.

This species is pretty generally distributed from the Shetland to the coast of Cornwall, it has been dredged at Falmouth, and found in trawl refuse brought in from the Channel off the Cornish coast. But all the specimens were taken from the back and gill chamfers of the Corwich crab (*Maia squinado*). They appear to live among the thick fur on the back of this spider crab, as if it was their natural habitat, their prehensile legs being peculiarly adapted for holding themselves on that animal.

GENUS, IPHIMEDIA.—*Rathke*.*Beit. zur Fauna, Norw.*

Cephalon produced anteriorly. Eyes two, antennæ simple. Hands feeble, imperfectly subchelate. Telson squamose emarginate.

IPHIMEDIA OBESA.—*Rathke*.—*L.c. nov act. Scop.*, vol. xx, p. 89, pl. iii, fig. 1; *Bate and Westwood, l.c.*, vol. i, p. 219.

Dredged near Drake's Island, in Plymouth Sound.

GENUS, SILGEBORGIA.—*Spence Bate*.*Cat. Brit. Mus.*, p. 118.

Cephalon but slightly produced. First pair of antennæ short, having a second appendage, hands large. Telson cleft.

SILGEBORGIA PALLIDA.—*Spence Bate, Bate and Westwood*, p. 203.

Plymouth Sound. I have no doubt but that it is the same species as *Gammarus brevicornis* of *Bruzellius* (Mem. on amphipoda of Skandinavia.)

GENUS, ISÆA.—*Milne Edwards*.*Hist. des Crust.*, t. iii, p. 26.

First pair of antennæ with secondary branch, hands subchelate, all the legs smaller but subchelate. Telson cylindrical, single.

ISÆA MONTAGUI.—*Milne Edwards, l.c.* p. 26, pl. xix, fig. 11.—*Bate and Westwood*, vol. i, p. 215.

I have frequently taken this species.

GENUS, UROTHÖE.—*Dana*.*U. S. Expl. Exp.*, p. 920.

Body scarcely compressed. Eyes apart. First pair of antennæ with secondary appendage. First two pair of feet subchelate. Telson double.

UROTHÖE ELEGANS.—*Spence Bate*.—*Bate and Westwood*, vol. i, p. 200.

This species is named from its having beautifully variegated colours when alive. It was taken from some trawl refuse from the neighbourhood of the Eddystone.

It bears a generally close resemblance to *U. irrostratus*, which Mr. Dana took in the Zooioco seas. Nor is this the only instance

in which I have observed a close affinity of our own crustacea with those of the antipodal seas.

SULCATOR ARENARIUS.—Sandfurrow maker.—*Spence Bate, Bate and Westwood, vol. 1, p. 189.*

I first found this species on the coast of South Wales, on sandy shores between the tide marks, but I found afterwards that undescribed specimens had been in the collection of the British Museum, which had been taken by Dr. Leach in the neighbourhood of Falmouth.

The late Mr. Albany Hancock has paid considerable attention to the furrows made by this creature, and described them in a paper "On the vermiform fossils in the mountain limestone districts of the North of England," published in the "Transactions of the Tyneside Nat. Field Club."

GENUS, SULCATOR.—*Spence Bate.*

*An. Nat. Hist., vol. xii, p. 504, and vol. xix, p. 140.—Bate and Westwood, p. 187.*

Cephalon anteriorly produced. First two pairs of legs feeble, imperfectly subchelate. Most of the points of the legs developed like scales.

DARWINIA.—*Spence Bate, Cat. Amps. Brit. Mus., p. 108.—Bate and Westwood, p. 182.*

Cephalon produced anteriorly. First two pairs of legs smaller than the succeeding, and subchelate. The portion of the animal that supports the swimming legs (pleon) lies generally closely compressed beneath the sterrunt of the anterior portion.

DARWINIA COMPRESSA.—*Spence Bate, Cat. Brit. Mus., p. 108, pl. —Bate and Westwood, l.c., vol. i, p. 184.*

This species was first taken on the shores of Banff by the well-known naturalist, Mr. Edward, and afterwards on the shores of Cornwall, where it was found off Polperro by Mr. Loughrin. These last were as white as writing paper, and in this respect differed from those received from the Moray Frith, which were of a brown hue. After having been kept for a short time the Cornish specimens assumed the colour of those from the Moray Firth. Hence we may assume that white is their colour while alive. Mr. Loughrin says that his specimens were procured either from

the throat of a codfish, or from the skin of a common dogfish (*Squalus acanthus*.) The swimmerets of these specimens were thickly covered with a species of *Vorticella*, a circumstance that is suggestive that they lived rather in the retired and quiet position of the throat of the codfish, which their black colour also supports, rather than on the external surface of a fast-swimming dogfish.

GENUS, MONOCULODES STIMPSON.

*Marine invert. Grand Manan, p. 54.*

Cephalon produced and depressed anteriorly. Eyes coalesced into one. First antennæ without a secondary appendage. First two pairs of feet subchelate, wrist antero-distally produced to the extremity of the inferior margin of the hand. Telson entire.

MONOCULODES STIMPSONI.—*Spence Bate, Cat. Brit. Mus., p. 105, pl. xvi, f. 3*—*Bate and Westwood, p. 168.*

Our first specimen was taken in the Channel off the coast of Cornwall, but it only consisting of a mutilated portion, the original description in the catalogue of the British Museum was taken. We have since seen a specimen taken by the Rev. Mr. Norman off the coast of Northumberland.

GAMARIDES.

GENUS, DEXAMINE.—*Leach.*

*Edin. Encyclopedia, vii, p. 433.*

First pair of antennæ having the third joint of the peduncle reduced to resemble the first articulus of the flagellum. Without a secondary appendage. Mandibles having no appendage, Hands feeble, subchelate. Telson single, divided.

DEXAMINE SPINOSA.—*Montagu, Lin. Trans., vol. xi, t. ii, fig. 1.*  
*Bate and Westwood, vol. i, p. 237.*

All round our coasts where naturalists have searched.

It is a prettily coloured species, brilliant red with dark crimson spots. Those that are found nearer the shore are less bright but darker hue, and obtain a stain of blue that lessens their brilliancy.

GENUS, ATYLUS.—*Leach.**Zool. Misc., ii, pl. lxix.*

Like *Dexamine*, but having the mandibles furnished with a palpiform appendage.

ATYLUS SWAMMERDAMII.—*Milne Edwards, Hist. des Crust., t. iii. Bate and Westwood's Sessile Eyed Crust., vol. i, p. 246.*

We have taken it in Plymouth Sound, and Mr. Loughrin has sent it to us from Polperro.

ATYLUS BISPISSOSUS.—*Spencee Bate, Cat. Amph. Brit. Mus., p. 104, pl. xxvii, fig. i.—Bate and Westwood, p. 250.*

We have dredged this species on the sandy bottom in Whitsand Bay, not far from the Rame Head, and have had it sent to us from Falmouth, as well as from Scotland and the coast of Northumberland.

GENUS, PHERUSA.—*Leach.**Edin. Ency., vii, p. 432.*

Like *Atylus*, but Telson not divided.

PHERUSA BICUSPIS.—*Kroyer, Grön Amph., p. 45, pl. i, fig. 1. Bate and Westwood, p. 253.*

We have had specimens taken at Falmouth, and Mr. Edward has sent it to us from Banff.

PHERUSA FUCICOLA.—*Leach, Edin. Ency. vii.—Bate and Westwood, p. 255.*

This is the type of the genus, and was taken first by Montagu from rocky shores in Devonshire. We have had specimens from Falmouth; from Polperro, where they were found by Mr. Loughrin; and from Banff, where they were procured by Mr. Edward, the Scottish naturalist.

GENUS, LEUCOTHÖE.—*Leach.*

Antennæ simple, subequal. Hands unequal. Second larger than the first, formed by the carpus or wrist being produced to reach beyond the next joint, and meeting the extremity of the finger.

LEUCOTHÖE ARTICULOSA.—*Montagu, Lin. Trans., vii, p. 70, pl. vi, fig. 6.—Bate and Westwood, p. 271.*

We have dredged it in Cawsand Bay, and Mr. Loughrin has sent it to us from Polperro.

GENUS, AORA.—*Kroyer*.

*Zidst. zur 2, 1, p. 335.*

First hand larger than the second, and formed by third joint having the infero-anterior angle produced to meet the extremity of the finger.

AORA GRACILIS.—*Spence Bate, Cat. Amph. Brit. Mus., p. 160, pl. xxix, fig. 7.*—*Bate and Westwood, l.c., p. 281.*

We took our first specimen on the coast of Glamorgan; we have since obtained it from St. Ives and off the Eddystone.

It is remarkable that the only other species of this genus known is that described by Kroyer and Nicolet, and closely resembling this in form, it is from the coast of Chili.

GENUS, MICRODEUTOPUS.—*Costa*.

First pair of antennæ larger than the second. First hand larger than the second.

MICRODEUTOPUS WEBSTERII.—*Spence Bate, Cat. Amph. Brit. Mus., p. 162, pl. xxx, fig. 2.*—*Bate and Westwood, p. 291.*

Mr. Webster dredged this species in Falmouth harbour.

MICRODEUTOPUS VERSICULATUS.—*Spence Bate, Cat. Amph. Brit. Mus., p. 165, pl. xx, fig. 5.*—*Bate and Westwood, p. 295.*

We have dredged this species in Plymouth Sound.

GENUS, GAMMARELLA.—*Spence Bate*.

*Cat. Amph. Brit. Mus., p. 179.*

First pair of antennæ with second appendage. First hand small, second large. Last appendage of the tail single, brown. Telson, single, cleft.

GAMMARELLA BREVEAUDATA.—*Milne Edwards, Hist. des Crust., t. iii, p. 53.*—*Bate and Westwood, p. 331.*

The first specimen of this species was taken by Milne Edwards at Morbihan, on the coast of France. Our specimen was taken by Mr. Loughrin, at Polperro.

GENUS, MELITA.—*Leach*.

*Edin. Ency., iii, p. 403.*

First antennæ longer than second, appendiculate. Second hand longer than the first.

MELITA PALMATA.—*Montagu, Lin. Trans., vii, p. 69, pt. 6, fig. 4.*  
*Bate and Westwood, p. 337.*

It has been taken by Dr. Leach at Plymouth. Mr. Loughrin has found it at Polperro. It is a species that is by no means plentiful even where it has been found.

MELITA OBTUSATA.—*Montagu, Lin. Trans., vol. xi, p. 5, fig. 7.*  
*—Bate and Westwood, p. 341.*

The original type of this species is in the British Museum, it having been taken by Col. Montagu, at Salecomb, on the south coast of Devon, from which the figure given in the *Sessile Eyed Crustacea* was taken, while the description was written from a recent specimen taken in Plymouth Sound.

MELITA PROXIMA.—*Spence Bate, Cat. Mus. Amph., p. 184, pt. xxxiii, fig. 4.*—*Bate and Westwood, p. 344.*

This species has been taken in Plymouth Sound, and Mr. Edwards, of Banff, has sent it to us from that locality.

MELITA GLADIOSA.—*Spence Bate, Cat. B. M., p. 185, pt. 33, f. 6.*—*Bate and Westwood, p. 346.*

Taken in Plymouth Sound. It resembles *Gammanes podayer* of Mr. Milne Edwards, which undoubtedly belongs to this genus.

#### GENUS, MÆRA.—*Leach.*

First pair of antennæ longer than the second, having a second appendage. Second hand larger than the first. Telson double.

MÆRA GROSSIMANA.—*Montagu, Lin. Trans., xi, p. 359.*

When alive the animal is very transparent, its colour being faint yellow, tinted with rose.

The type was taken by Col. Montagu, in rocky pools on the south coast of Devon, but it has since been taken in Plymouth Sound, Penzance, and Polperro, as well as on the coasts of Scotland and France.

It bears a close resemblance to *Mæra tenella*, which Dana found in the Feejee Islands.

#### GENUS, EURYSTHEUS.—*Spence Bate.*

Antennæ subequally long. First pair with a second branch. Hands subchelate, second larger than the first; last pair of caudal appendages biramose, branches equal. Telson cylindrical.



EURYSTHEUS ERYTHROPHTHATMUS.—*Lilgeborg, in ofvers af Kongl. Vet. Akad. Zorhandl*, 1855, p. 124.

Not uncommon in Plymouth Sound, and it has been sent to us, among other places, from Banff, by Mr. Edward.

GENUS, AMATHILLA.—*Bate and Westwood*, p. 459.

Head produced to a sharp point. Antennæ rather short. First pair with a second branch. Hands small, subequal. Back carinated. Telson entire, slightly emarginate at apex.

AMATHILLA SABINI.—*Leach, Rosse's First Voyage, oct. ed., ii, p. 178.*

This is an arctic species. First taken in Baffin's Bay by Genl. Sabine, during Rosse's first expedition. It has since been found on all the northern places where naturalists have dredged, both on the European and American coasts. Those from the Arctic seas and the coast of Scotland are large, being about an inch in length, but the size appears to diminish in regular proportions as it progresses southward. In Shetland and the Moray Frith it is scarcely as large as the Arctic specimens. At the Menai Straits it is scarcely half as large, and on the south coast of Cornwall it appears to have reached its minimum size, as it has not been recorded further south. It will be found in rocky pools near low water mark occasionally everywhere.

GENUS, GAMMARUS.—*Fabricius.*

Three posterior rings of the body furnished with bundles of short spines. Eyes long, narrow, or curved. Antennæ slender, with a short second branch. Hands not large, subequal. Telson double.

GAMMARUS MARINUS.—*Leach, Lin. Trans, xi, p.*—*Bate and Westwood*, p. 370.

The colour of the animal is olive-green. They are very gregarious, and live amongst the seaweed on our shores, and frequent estuaries a considerable distance from the mouth of every river.

GAMMARUS CAMPYLOPS.—*Leach, Edin. Ency.*—*Bate and Westwood*, p. 375.

This species is named from the crooked shape of the eyes. It appears to be an intermediate form between *G. marinus*, and *locusta*. It is not very common, but it has been taken among other places in Plymouth Sound.

GAMMARUS LOCUSTA.—*Linnaeus, Fauna Suec.*, 2nd ed., p. 497.—*Bate and Westwood*, p. 378.

This species appears to be pretty generally distributed all round Europe, and may be found in pools near low water. It inhabits the sea a little further from the shore than *G. marinus*. The parent in this species has been observed by Dr. Salter to watch over and care for its newly hatched young. These swim round and follow the parent, and when frightened will rush to her and hide themselves in the incubating pouch, in which they nestled until the danger was passed.

GAMMARUS PULEX.—*Linnaeus, Syst. Nat.*, 1055.—*Bate and Westwood*, p. 388.

Common in all our ponds and fresh water rivers, but according to our own experience less frequent and smaller than in other parts of England.

GENUS, MEGAMÆRA.—*Spence Bate*.

MEGAMÆRA SEMISERATA.—*Spence Bate*.—*Bate and Westwood*, p. 401.

This species as yet has only been recorded from Plymouth Sound.

MEGAMÆRA LONGIMANA.—(Long handed screw).—*Leach, MSS.*—*Bate and Westwood*, p. 403.

This has been found in many places in Great Britain and Ireland, but does not appear to be common anywhere. In Cornwall we only know it from Penzance, and there it was taken under St. Michael's Mount.

MEGAMÆRA OTHONIS.—*Milne Edwards, Ann. des Sc. Nat.*, t. xx, p. 373, pl. x, fig. 11.—*Bate and Westwood*, p. 405.

We have dredged this species in Plymouth Sound, and Mr. Loughrin has sent it to us from Polperro, but it has not been taken any where else in the British Isles.

MEGAMÆRA BREVICAUDATA.—*Spence Bate, Cat. Amph. B. M.*—*Bate and Westwood*, p. 409.

Dredged in Plymouth Sound.

## DOMICOLA.

## COROPHIDÆ.—(PODOCERIDES.)

GEUS, AMPHITOE.—*Leach.*

Antennæ subequally long, first without a second branch. Head subequal. Last appendage of the tail having two branches, one with short spines or hooks, the other without. Telson single.

AMPHITOE RUBRICATA.—*Montagu, Lin. Trans., ix, p. 99.—Bate and Westwood, p. 418.*

The adult is colored a brilliant crimson with large blotches of white. When young the animal is a yellowish green with minute red spots and a few white blotches.

The animals of this subdivision live in homes of their own construction. This species makes one by collecting stray material round some chosen nook, which it binds together with an exquisitely delicate web. We have not been able to discover how this web is secreted, whether by the mouth or some special organ.

It is tolerably common in a few fathoms of water or on shores, but the first we ever saw were dredged in Plymouth Sound; of more brilliant a colour than any paint we could prepare to represent it.

AMPHITOE VITTORINA.—*Spence Bate, Cat. Amph. B. M.—Bate and Westwood, p. 422.*

Common on stony beaches associated with *Gammarus*, being larger, it may readily be detected as a "Triton amongst the minnows."

GENUS, SUNAMPHITOE.—*Spence Bate.*

*Cat. Amph. B. M.—Bate and Westwood, p. 429.*

Like *Amphitoe*, except that the Telson or extremity of tail ends in a hook.

SUNAMPHITOE HAMULUS.—*Spence Bate, Cat. Amph. B. M.—Bate and Westwood, p. 430.*

A specimen of this species has been sent to us from Penzance.

SUNAMPHITOE CONFORMATA.—*Spence Bate, Cat. Amph. B. M.—Bate and Westwood, p. 432.*

One specimen has been taken by us in Plymouth Sound, another was sent to us from the Shetlands.

GENUS, *PODOCERUS*.—*Leach*.

*Linn. Trans*, xi, p. 360.

First antennæ with minute second appendage; second antennæ not multarticulate, laminating in short strong spines or hooks. Hands unequal, second pair largest. Telson single, scalelike.

*PODOCERUS PULCHELLUS*.—*Leach, Edin. Ency.*, vii, p. 433.—*Bate and Westwood, l.c.*, p. 436.

We have taken it in Plymouth Sound, and Mr. Edward has sent it to us from Banff. It closely resembles *P. validus*, Dana, of South America.

*PODOCERUS VARIEGATUS*.—*Leach, Edin. Ency.*, vii, p. 433.—*Bate and Westwood, p.* 439.

This species is very common amongst the weed attached to buoys and floating objects, amongst which, and the sertularia, they build and occupy nests.

We have had specimens from Mr. Edward, of Banff, and Mr. Loughrin, of Polperro.

*PODOCERUS CAPILLATUS*.—*Rathke, Nov. Acta. Acad. Scop.*, xx, pl. iv, fig. 8.—*Bate and Westwood, p.* 442.

This species also builds very pretty nests among the branches of various kinds of zoophytes. In one of these we found a mother with the young of different ages, demonstrating tolerably clearly in this comparatively low group of animals the instinct of maternal love.

*PODOCERUS FALCATUS*.—*Montagu, Lin. Trans.*, ix, p. 100, pl. v, fig. 2.—*Bate and Westwood, p.* 445.

Dredged in Plymouth Sound, and along the southern coast of Cornwall.

GENUS, *CERAPUS*.—*Say*.

*Jour. Acad. Phil.*, i, p. 49.

Body not laterally compressed. Antennæ subequal, first pair with a second branch. Second pair with flagellum multarticulate. First pair of hands subchelate, second larger than the first, and

complexly\* chelate; posterior of tail appendages unbranched. Telson rudimentary.

The animals of this genus construct tubes in which they dwell.

CERAPUS ABDITUS.—*Templeton, Trans. Ent. Soc.*, 1, p. 188, pl.

*xx*, fig. 3.—*Bate and Westwood, l.c.*, p. 456.

Templeton took the specimens, from which he described the species between the southern and northern hemispheres. Dana has described a crustacean from the coast of Brazil under the name of *Pygetilus brasiliensis*, which nearly resembles this British species, which offers among other facts, evidence of the approximation of forms between British and South American crustacea.

It has been taken in Plymouth Sound. According to Mr. Templeton, it lives in a long narrow membranous tube.

CERAPUS, Fem.—GENUS, DERCOTHÖE.—*Dana, U.S. Expl. Exp.*,

p. 968.—*Bate and Westwood*, p. 459.

These are females of the last genus, but differ so considerably in form, that they were described as a separate genus by Dana, and the name is retained in Bate and Westwood's "Sessile-Eyed Crustacea" as a temporary convenience for the females until the males have been determined. But we have little doubt but that *Dereothoe punctatus* is the female of *Cerapus abditus*.

The second hand is smaller, and the carpus only projects as a scale below the hand.

GENUS, NÆNIA.—*Spence Bate*.

*Cat. Amph. B. M.*, p. 271.—*Bate and Westwood*, p. 471.

Antennæ subequal; no second branch. Hands subchelate, posterior pair of caudal appendages two branched. Telson cylindrical.

NÆNIA TUBERCULOSA.—*Spence Bate, Cat. Amph. B. M.*, p. 271,

pl. *xlvi*, fig. 2.—*Bate and Westwood*, p. 472.

We have taken this species not unfrequently in the dredge off Plymouth, and we have received it from Banff, from Mr. Edward.

A closely allied species of this genus is known to inhabit a whelk shell, together with a soldier crab and annelid, in the peaceful character of a "Happy family."

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\* Complexly chelate means, when the claw is formed by more than two joints.

## COROPHIIDES.

GENUS, CYRTOPHIUM.—*Dana*.*U. S. Expl. Exp.*, p. 839.

Head subquadrate. Body broad, narrowing posteriorly. Eyes prominent. Antennæ subpediform. Hands subchelate. Second much larger than first. Last pair of tail appendages rudimentary. Telson squamiferous.

We consider that Dana's genus of *Platophium* is identical with this.

This species has been taken with the dredge off Falmouth, and obtained on the shore of St. Michael's Mount

GENUS, COROPHIUM.—*Latrielle*.*Gen. Crust.*, i, p. 58—*Bate and Westwood*, p. 492.

Body not compressed. Eyes small. First antennæ multarticulate. Second subpediform. First hand subchelate, second simple.

COROPHIUM LONGICORNE.—*Latr.*, *Gen. Crust. et Ent.*, 1, p. 89.—*Bate and Westwood*, p. 493.

This species may probably be found all round the British coast. Quatrefages, in his "Rambles of a Naturalist," says that "they come from the open sea in April, in myriads, to wage war with the annelids, which they entirely destroy before the end of May. They then attack the mollusca and fish, all through the summer, and disappear in a single night about the end of October."

Mr. Walker, of Chester, tried several experiments with this animal, by keeping it in small vessels with some nereid annelids, but they appeared to dwell together in peace.

COROPHIUM BONELLI.—*Milne Edwards*, *Hist. des Crust.*, t. iii, p.67.—*Bate and Westwood*, p. 497.

This species has also been taken in Plymouth Sound.

## CHELURIDÆ.

GENUS, CHELURA.—*Philippi*.*In Wiegman's Arch.*, 1839.—*Bate and Westwood*, p. 502.

Body not compressed. First antennæ short, second long, robust, flagellum multarticulate and spatuliform. Hands chelate. Telson single.

CHELURA TEREBRANS.—*Philippi*, vol. v, p. 120, pl. iii, fig. 5.—*Bate and Westwood*, p. 503.

This is one of our most destructive wood-eating crustacea. It is commonly associated with *Limnoria legurium*, but fortunately for our piles and pier woodwork, it is not prolific as the smaller *Limnoria*. It has been found to destroy a piece of sound timber thirteen inches square in less than ten years. It eats into the timber in a level with the mud to the usual height of neap tides, avoiding, however, the knots in the wood. In this manner the wood is riddled in every direction, and is then easily destroyed by the force of the waves.

## HYPERINA.

### HYPERIDÆ.

GENUS, LESTRIGONUS.—*Milne Edwards*.

*Hist. des Crust.*, t. iii, p. 81.—*Bate and Westwood's Brit. Sessile-Eyed Crustacea*, vol. i, p. 3.

Head orbicular, deeper than broad. Anterior division of the body (pereion) broader than the posterior (pleon). Eyes large. Telson single, triangular.

These are supposed to be the males of the following

GENUS, HYPERIA.—*Latrielle*.

*Bate and Westwood*, vol. 2, p. 11.

HYPERIA GALBA.—*Montagu*, *Lin. Trans.*, xi, p. 4, pl. 2, fig. 2.  
Taken in the sea floating in medusæ, off the coast.

### CAPELLIDÆ.

GENUS, PROTO.—*Leach*.

*Lin. Trans.*, xi, p. 362.—*Bate and Westwood*, p. 36.

Head and first somite of the body united. Posterior portion of the body rudimentary.

PROTO PEDATA.—*Abildgaard*, in *Müller*, *Zool. Dan.*, pl. iii, p. 33  
pl. cl, fig. 1, 2.—*Bate and Westwood*, p. 38.

Occasionally found in dredging all round the coast. The late Mr. R. Q. Couch took it at Mousehole, Cornwall.

GENUS, PROTELLA.—*Dana*.*U.S. Expl. Exp.*, p. 812.

Like Proto, but having rudimentary appendages to the two somites succeeding the hands.

PROTELLA PHASMA.—*Montagu, Trans. Lin. Soc.*, vol. ii, p. 66, pl vi, fig. 3.—*Bate and Westwood*, p. 45.

This species was first found by Col. Montagu, and we have obtained it in the neighbourhood of Plymouth; and Mr. R. Q. Couch has found it among confervæ, at Lariggan rocks, Mount's Bay, Cornwall.

GENUS, CAPRELLA.—*Linnaeus*.

Like Protella, but without any appendage to the two central segments of the body.

CAPRELLA LINEARIS (Skeleton Shrimp).—*Linnaeus' Syst. Nat.*, ii, p. 1056.—*Bate and Westwood*, p. 52.

All round our shores, amongst stones and weed. This animal appears to watch and protect its young, they creeping about the parent and looking like small branches of weed attached to her body.

CAPRELLA LOBATA.—*Müller, Zool. Dan., Prod.*, 197.—*Bate and Westwood*, p. 57.

We have taken this species in Plymouth Sound, and Mr. Edward has sent it to us from the Moray Frith.

CAPRELLA ACUTIFRONS.—*Latrielle's N. Dict. de. Hist. Nat.*, 2nd ed., vol. vi, p. 433.—*Bate and Westwood*, p. 60

Taken in Plymouth Sound; and Mr. R. Q. Couch informed me that it is not uncommon among corallines in Mount's Bay.

This species appears to have a near representation in different parts of the globe. *Caprella geometrica*, of the United States; and *Caprella robusta*, from Rio Janeiro, as well as *Caprella nodosa*, from the Mauritius, would no doubt be considered the same species as this were they not found in such very distant parts of the globe.

CAPRELLA HYSTRYX.—*Kroyer, Nat. Hist. Tid.*, iv, 603, pl. viii, fig. 20, 26.—*Bate and Westwood*, p. 63.

This species has been found on the shores of the North of England, and also in Plymouth Sound.



CAPRELLA ACANTHIFERA (Skull-headed Skeleton Shrimp).—*Leach, Edin. Ency., vii, p. 404.*—*Bate and Westwood, p. 65.*

It has been taken at Plymouth, on Drake's Island, at low water; as well as dredged in the Sound. Mr. Edward has sent it to us from Banff.

CAPRELLA TUBERCULATA.—*Guerin, Seon. Ran. Crust., pl. xxviii, fig. 1.*—*Bate and Westwood, p. 68.*

Mr. Couch found a considerable number in the crevices of a crab-pot buoy, thrown on the coast at Polperro during a heavy gale; and Mr. R. Q. Couch obtained a female in Gwavas Lake, off St. Michael's Mount.

CAPRELLA ZEGUILIBRA.—*Say, Journ. Acad. Phil., 1, p. 391.*—*Bate and Westwood, p. 71.*

Taken in Plymouth Sound on buoys hid among weeds.

Specimens apparently identical with this species have been sent to us from the North of England, from Rio Janeiro, from Hong Kong, and North America.

## ISOPODA ABERANTIA.

### TANAIDÆ.

GENUS, TANAIS.—*Audouin and Milne Edwards.*

Head and first segment united. Body elongated. Antennæ short. First hand large, didactyle; second pair slender.

TANAIS VITTATUS.—*Rathke, Nor. Act., 20, pl. i.*—*Bate and Westwood, p. 125.*

Found at Polperro by Mr. Loughrin.

TANAIS DULONGII.—*Audouin, Expl. pl. Egypt., t. xi, fig. 1.*—*Bate and Westwood, p. 129.*

This species was first taken on the coast of Egypt. We found it in tolerable numbers in the worm-eaten timber during the erection of the battery inside the breakwater, Plymouth; and at Polperro, where it was found by Mr. Loughrin.

GENUS, APSEUDES.—*Leach.*

*Edin. Ency., vol. vii, p. 404.*

Body elongated. Head having first segment united. First antennæ longer than the second. Second antennæ with a foli-

aceous appendage. Last pair of caudal appendages two-branched.

APSEUDES TALPA.—*Montagu, Lin. Trans., ix, p. 98, t. 6, f. 6.*—*Bate and Westwood's Sessile-Eyed Crustacea, vol. ii, p. 149.*

The first specimen of this very interesting animal was found by Col. Montagu on a large scallop shell (*Peeten maximus*), at Salcombe, on the south coast of Devon. It has been found in the Channel Isles, and in Plymouth Sound.

### ANTHURIDÆ.

GENUS, ANTHURA.—*Leach.*

*Bate and Westwood, p. 157.*

Body slender, elongated. Head and segments quite distinct. First pair of legs robust and imperfectly subchelate, all the rest filiform. Tail appendages arranged to be dorsally concave.

ANTHURA GRACILIS.—*Montagu, p. 104.*—*Bate and Westwood, p. 162.*

First taken by Col. Montagu, many years ago, at his usual hunting ground, Salcombe harbour. It has since been taken at Falmouth, and off the south coast.

### ANCEIDÆ.

GENUS, ANCEUS.—*Risso.*

*Crust. des Nice, p. 51.*—*Bate and Westwood, p. 170.*

Male. Head square. Mandibles developed anteriorly like antennæ, body having two segments wanting, the anterior division (pereion) much broader than the posterior (pleon). Only five pairs of walking legs, no hands.

ANCEUS MAXILLARIS.—*Montagu, Lin. Trans., vii, p. 65, t. 6, f. 2.*—*Bate and Westwood, p. 187.*

In crevices of rocks between tides all round the coast. It has been taken in such places at extreme low water, at Gyllyngvase, near Falmouth, as well as at Polperro, and Plymouth. It has also been taken in trawl refuse.

GENUS, PRANISA. (Female of *Anceus*.)

Head pointed. Antennæ, as well as the appendages of the mouth, small. Three last segments of the anterior portion of the body united into one. Posterior portion much narrower than the anterior. Five legs, slender.

ANCEUS (PRANISA) CERULIATA.—*Desmarest, Consid. sm. Crust.*, p. 284.

This is the female, probably, of *Anceus maxillaris*.

These two animals for a long time were considered as representing two distinct genera, and by some as separate families, their habits and appearance are so unlike each other. It now appears from the researches of M. Hepe, of Brest, who has the honor of first determining their relative connection with each other to be male and female. In early life the two resemble each other very closely, and they then live as parasites on the external surface of fish; as they grow older the male assumes the form of *Anceus*, and the female continues unaltered in the form of *Pranisa*. After quitting their parasitic mode of life they appear, as far as we can judge, particularly the male, to live without eating, for it has no mouth, and the mandibles are placed in the front of the head like antennæ. The female appears to exist as a huge ovisac, and when the young are matured the mother appears to be empty, and almost devoid of the traces of internal organs. The life of both male and female now appear, as far as usefulness is concerned, to be over, for although I have kept them alive for months in this condition they never appear to change, or seek or obtain food, but lie motionless and feeble.

## ISOPODA NORMALIA.

### BOPYRIDÆ.

GENUS, BOPYRUS.—*Latrielle*.

Male. Small, narrow; antennæ rudimentary.

Female six times as large as the male. Pearshaped, unsymmetrical. Body much flattened.

BOPYRUS SQUILLARIUS.—*Latrielle, Hist. Nat. Crust.*, vii, p. 55, t. 59, f. 2.—*Bate and Westwood*, p. 218.

Frequently found under the shell of prawns and shrimps. From Polperro and off the coast.

GENUS, PHRYXUS.—*Rathke*.

Male. Very minute and elongated, head transversely minute, with two dark minute eyes.

Female. Large inert nearly globular mass, with the segments scarcely indicated by depressions, with wide and oviparous plates.

PHRYXUS LOGIBRACHITUS.—*Bate and Westwood*, p. 246.

Specimens of this species have been taken at Polperro, upon an old *Galathea squamifera*, by Mr. Loughrin.

### ÆGIDÆ.

GENUS, ÆGA.—*Leach*.

Oval in shape, antennæ short, three anterior pairs of legs robust, with hands. Four posterior pairs slender, pediform.

ÆGABICARINATA.—*Leach, Dict. Sc. Nat.*, xii, p. 349.—*Bate and Westwood*, p. 278.

Taken in trawl refuse off Plymouth.

GENUS, ROCINELLA.—*Leach*.

Eyes very large, nearly uniting at the centre; second antennæ nearly one-third the length of body, rest like Æga.

ROCINELLA DANMONIENSIS.—*Leach, Dict. Sci. Nat.*, xii, p. 349.—*Bate and Westwood*, p. 391.

This for half a century was known only by one specimen in the British Museum, named by Dr. Leach. Taken in Plymouth Sound. It has since been found at Polperro.

GENUS, CORIOLANA.—*Leach*.

Like Rocinella, but having the eyes at the margin of the head. CORIOLANA SPINIPES.—*Bate and Westwood*, p. 299.

Taken at Falmouth by Dr. Leach and Mr. Cranch, and we have dredged it in Plymouth Sound.

M. Hepe, of Brest, has described several species of this genus that he had taken burrowing in sand on the coast of Brittany.

GENUS, CONILERA.—*Leach*.

Body subcylindrical, narrow, equal in width from head to tail. CONILERA CYLINDRACEA.—*Montagu*, p. 71, t. 6, f. 8.—*Bate and Westwood*, p. 304.

This species was first obtained by Col. Montagu. It has since been taken in Plymouth Sound, near the Knap buoy; from trawlers off the coast; and from Polperro.

GENUS, EURYDICE.—*Leach*.

Ovate. First antennæ short, second long; legs small.

*EURYDICE PULCHRA*.—*Leach, Lin. Trans., xi, p. 370.*—*Bate and Westwood, p. 310.*

Taken in pools on the coast.

Mr. Walker, of Brookfield, near Chester, says that "It is a most savage little beast. If you are a moment still in the water while bathing, dozens will fasten upon you and nip most unpleasantly. I have had to jump into the water again after coming out from bathing and splash violently to get rid of the hosts that had stuck to me while clinging to the side of the boat preparatory to getting in. They continue to bite after you are out of the water. I once put a wretched *Hyperia*, which I had taken from a *Rhizostoma*, into a small bottle with two *Eurydices*, the blood-thirsty little brutes attacked him like tigers, and soon sucked his shell clean."

## LIBERATICA.

### *APELLIDÆ.*

GENUS, *JÆRA*.—*Leach.*

First antennæ short, second more than half the length of the animal. Legs uniform, slender. Posterior portion of the body (pleon) united into one segment, short and round.

*JÆRA ALBIFRONS*.—*Montagu; Bate and Westwood, p. 317.*

It has been found especially abundant in crevices of rocks at half-tide near Falmouth, and in Plymouth harbour.

*JÆRA NORDMANNI*.—*Rathke, Fauna der Kryn., pl. 6, f. 1, 5.*—*Bate and Westwood, p. 322.*

Rathke obtained his specimen at Cape Parthenon, in the Crimea, under stones. Our specimens were found at Plymouth and South Wales.

GENUS, *JANIRA*.—*Leach.*

Like *Jæra*, but having the second antennæ and the posterior tail appendages very long.

*JANIRA MACULOSA*.—*Leach, Edin. Ency., vii, p. 434.*—*Bate and Westwood, p. 338.*

Not unfrequent on the coast. They have been taken at Falmouth, Polperro, and Plymouth.

GENUS, ASELLUS.—*Geoffray*.

Body long, oval, like Janira. First antennæ short, second long. First pair of legs with hands, all the rest pediform, slender.

ASELLUS AQUATICUS.—*Linnaeus, Syst. Nat., ii, 1061.*—*Bate and Westwood, p. 343.*

— Common in freshwater ponds and ditches throughout the kingdom.

GENUS, LIMNORIA.—*Leach*.

Like Asellus, but with shorter segments to the body. Posterior portion divided into six segments.

LIMNORIA LIGNORUM. (The Gribble).—*Rathke, Skribt. af Natur. Selsk., vol. 101, t. 3, f. 14 (1799).*—*Bate and Westwood, p. 351.*

All round our coast, in submarine timber, which it eats with avidity. The bores are one fifteenth of an inch in diameter. Admiral Sir W. Drummond, when Superintendent of H.M. Dockyard, Devonport, afforded me every facility to examine the submerged timber in the arsenal and Sound. Assisted by the extensive knowledge and experience of Mr. Moore, the master shipwright of the yard, I was by comparison of dates, according to the length of time that the timber was submerged, able to arrive at a general conclusion that these animals destroyed the sunken wood at the average rate of one quarter to half an inch in depth a year. The earlier years were scarcely as much, but that with time the rate increased, so that a five inch solid balk of timber would be eaten up in about ten years. They seemed to attack all timbers equally, but the knots resisted their depredation, and the most successful of artificial means was the rust that penetrated the wood from the presence of nails and bolts of iron.

## ARCTURIDÆ.

GENUS, ARCTURUS.—*Latrielle*.

Body long. First antennæ short; second antennæ long. Four anterior legs filiform. Three posterior pediform.

ARCTURUS LONGICORNIS.—*Sowerby, Brit. Miscel., t. 19.*—*Bate and Westwood, p. 365.*

Occasionally taken all round our coast. A colony of young animals was taken, attaching themselves to the spines of *Echinus sphaerus*, off Plymouth. The young of these animals for some time cling to the parent, hanging mostly about the antennæ.

### IDOTEIDÆ.

GENUS, IDOTEA.—*Fabricius*.

Body long and narrow, legs subequal; posterior portion of the body united into one segment, having no tail appendages posteriorly projecting.

IDOTEA TRICUSPIDATA.—*Desmarest, Cons. Crust., p. 289.—Bate and Westwood, p. 381.*

All along the coast. Among the largest specimens that we have seen—one inch and a quarter long—were some taken off the Dudman.

IDOTEA PELAGICA.—*Leach, Lin. Trans., xi, p. 365.—Bate and Westwood, p. 384.*

All round our coast, amongst weed. In Cornwall it has been taken near the Eddystone.

IDOTEA EMARGINATA.—*Fabricius, Ent. Syst. ii, p. 508.—Bate and Westwood, p. 387.*

Common among weeds all round the coasts of Europe. On the coast of Cornwall it was found among trawl refuse, and in the stomach of fish.

IDOTEA LINEARIS.—*Pennant, Brit. Zool. (1777), iv, 118, f. 2.—Bate and Westwood, p. 388.*

This species is not uncommon on many parts of the British coast. We have dredged it near Plymouth, where it is not uncommon. I received it from Falmouth. It generally assumes the colour of the weed on which it feeds.

IDOTEA PARALLELLA.—*Costa, d' Regno d' Napoli Crust, pl. xi, fig. 2.—Bate and Westwood, p. 391.*

This rather rare species has been taken at Falmouth and at Polperro. It bears a close resemblance to *Cleantis linearis*, of Dana, which was taken from the stomach of a fish in Rio Negro, North Patagonia.

IDOTEA ACUMINATA.—*Leach, Edin. Ency., vii, 438.—Bate and Westwood, 394.*

Mr. W. P. Cocks took some specimens in the trawl refuse, at Gyllyngvase, Falmouth, and some specimens are in the Hopeian Collection at Oxford, and labelled "South-west Coast of England." It has also been taken in Scotland.

IDOTEA APPENDICULATA.—*Risso, Hist. Nat. de l'Ent. Nereid, vol. v, p. 107, 14, f. 29.*

Not very common, it has been taken at Polperro.

### SPHÆROMIDÆ.

GENUS, SPHÆROMA.—*Latrielle.*

Animal capable of rolling itself into a ball. Head small. Eyes dorsally placed at the posterior angles. Antennæ short. Body wider than head. Posterior portion of the body (pleon) united into one segment.

SPHÆROMA SERRATUM.—*Fabricius, Mant. Inst., 1, p. 242.*—*Bate and Westwood, p. 405.*

This species is common under stones and among pebbles on all our coasts, from Kent to Cornwall, and in the Mediterranean. We have also dredged fine specimens in Plymouth Sound, and observed quantities in brackish streams in South Wales.

SPHÆROMA RUGICANDATA.—*Leach, Edin. Ency., vii, pp. 405-433.*—*Bate and Westwood, p. 408.*

From the Hebrides to the coast of France has this animal been obtained. In Cornwall we have found it at the mouth of the river Tamar.

This is a very active species, swimming, as all of the genus do, with its back downwards.

SPHÆROMA PRIDEAUXIANAM.—*Leach, Dict. Sci. Nat., xii, p. 345.*—*Bate and Westwood, p. 455.*

"Dr. Leach obtained this unique specimen from Mr. C. Prideaux, who took it on the west coast of Devonshire" (probably Plymouth Sound).

GENUS, DYNAMENE.—*Leach.*

Resembles a male Sphæroma, but is distinguished from it by a notch in the tail.



DYNAMENE RUBRA.—*Leach, Diet. Sci. Nat., xii, p. 344.—Bate and Westwood, p. 419.*

Occurs all round our coast.

DYNAMENE MONTAGUI.—*Leach, Diet. Sci. Nat., xii, p. 344.—Bate and Westwood, p. 423.*

We have taken it among *fuci* between tide marks in Cornwall. It is tolerably common associated with other allied forms all round our coast, on rocky beaches.

GENUS, CYMODOCEA.—*Leach.*

Like *Dynamene*, but with a tooth in the centre of the emargination in the middle of the tail.

CYMODOCEA EMARGINATA.—*Leach, Diet. Sci. Nat., xii, p. 343.—Bate and Westwood, p. 428.*

Dr. Leach took his specimen at Plymouth, under Mount Batten. Mr. John Cranch found specimens less strongly granulose, at Falmouth.

GENUS, NÆSA.—*Leach.*

Like *Cymodocea*, but with the sixth segment of the body dorsally produced into a strong bidentate process.

NÆSA BIDENTATA.—*Adams, Trans. Lin. Soc., vol. v, p. 812, f. 3, 4 Bate and Westwood, p. 431.*

Common probably all round the south western coast of England, including the rocky shores of Cornwall, where it has been found.

GENUS, CAMPECOPEA.—*Leach.*

Six segments, and with a single long dorsal tooth in the male.

CAMPECOPEA HIRSUTA.—*Montagu, Trans. Lin., vii, p. 71, t. 5, f. 8. Bate and Westwood, p. 434.*

This species was found by Montagu on the coast of Devonshire. We have taken it in some profusion at Torquay and Polperro, amongst the small dry *fuci* that exist on the surface of the rocks within reach of the spray of the sea, but where the sun appears to drain off all moisture.

CAMPECOPEA CRANCHII.—*Leach, Diet. Sci. Nat., xii, p. 341.—Bate and Westwood, p. 436.*

Found with the preceding, and is probably the female. Taken at Falmouth, as well as plentifully mingled with the former species in the localities named.

## ÆRO-SPIRANTIA.

## ONISCIDÆ.

GENUS, LIGIA.—*Fabricius*.

First antennæ rudimentary, second long. Tail appendage directed posteriorly, having two branches.

LIGIA OCEANICA.—*Lin. Syst. Nat.*, ii, p. 1061.—*Bate and Westwood*, p. 444.

This species is common on all our coasts, running with agility, and when frightened simulating death. It does not live in water but on the sea-shore, within reach of the spray. It feeds on decaying animal and vegetable substances.

GENUS, PHILOSCIA.—*Latrielle*.

Ovate, sub-depressed. First antennæ rudimentary; second, eight-pointed; tail appendage with two unequal branches.

PHILOSCIA MUSCORUM.—*Scopelli, Entom. Carniol.*, p. 1145.—*Bate and Westwood*, p. 480.

This species is widely distributed and very common, preferring dry situations under leaves, stones, and moss, near the sea-shore.

PHILOSCIA COUCHII.—*Kinahan, Nat. Hist. Rev.*, vol. v, 1858, p. 193, pl. 23, fig. 4.—*Bate and Westwood*, p. 452.

This species runs with agility, but does not roll itself into a ball. It was discovered at Talland Cove, near Polperro. Prof. Kinahan, Trinity College, Dublin, and the writer, were returning from paying a visit to Mr. Couch, when the former found it at the margin of a high tide, mingled with *Ligia oceanica*, *Porcellio scaber*, and *Orchestia littorea*.

GENUS, PHILOUGRIA.—*Kinahan*.

Like *Philoscia*, but with second antennæ having nine or ten joints.

PHILOUGRIA ARIPARIA.—*Koch, Deutsch Crust.*; 22, 17.—*Bate and Westwood*, p. 456.

At Plymouth. At Polperro it is not uncommon in the garden of the inn. At Looe it is abundant among sticks by the river side. It is found in very moist places amongst all kinds of decaying matter. It runs with agility, and buries itself deep in

the ground, and generally congregates in numbers. It feigns death, but does not roll itself up in the least.

*PHILOUGRIA ROSEA*.—*Koch, Deutsch Crust.*, 22, 16.—*Bate and Westwood*, p. 460.

It is tolerably abundant in gardens in Plymouth. This is the only habitat yet known in England. We have little doubt but that it only has to be looked for in Cornwall to be found. It is of a pretty rosy colour, and may be found in garden pots and crevices of the yards.

GENUS, *ONISCUS*.—*Linnaeus*.

Head with large lateral lobes. Second antennæ eight-jointed; second joint detailed at the base. Tail appendage imbranched short.

*ONISCUS ASELLUS*.—*Lin. Syst. Nat.*, ii, p. 1061.—*Bate and Westwood*, p. 468.

Common throughout England, Scotland, and Ireland, under decaying vegetable and animal matter. Common near the sea.

GENUS, *PORCELLIO*.—*Latrielle*.

Second antennæ seven jointed. Tail appendage with outer branch trigonate, exposed; inner, small and concealed.

*PORCELLIO SCABER*.—*Latrielle, Hist. Nat. Crust. et Ins.*, vii, p. 45.  
—*Bate and Westwood*, p. 475.

This species runs with agility, and partially rolls itself into a ball when alarmed. It has been observed feeding on living caterpillars; frequenting moist places where decaying vegetation is found, also among sea-weed with *Ligia*. It is partial to growing vegetables, and enjoys ripe fruit. Common throughout England and Ireland.

I have little doubt but that most, if not all the British species might be found in Cornwall if they were looked for.

GENUS, *ARMADILLO*.—*Latrielle*.

Very convex. Capable of rolling itself into a ball. Second antennæ seven-jointed. Tail appendages not reaching beyond the margin of the body.

*ARMADILLO VULGARIS*.—*Latrielle, Hist. Nat. Crust. et Ins.*, vii, p. 48.—*Bate and Westwood*, p. 492.

This species is widely dispersed and very common in Devonshire and Cornwall.

In former times it was highly reputed for its supposed medicinal virtues, and was inserted as a medical agent in the older books of *Materia Medica*. Though discarded from the *Pharmacopœia*, it is still taken medicinally in some parts of Somersetshire.

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## ENTOMOSTRACOUS CRUSTACEA.

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### OSTRACODA.

The following species were dredged off the Cornish coast, and were examined and named by Mr. G. S. Brady, F.L.S.

Pontocypris	mytiloides	..	Norman.
"	trigonella	.. ..	G. O. Sars.
"	angusta	.. ..	Brady.
Bairdia	inflata	.. ..	Norman.
"	acanthigera	..	Brady.
Cythere	pellucida	.. ..	Baird.
"	tenera	.. ..	Brady.
"	badia	.. ..	Brady.
"	convexa	.. ..	Baird.
"	finmarchica	..	Sars.
"	villtosa	.. ..	Sars.
"	emaciata	.. ..	Brady.
"	semipunctata	..	Brady.
"	cuneiformis	..	Brady.
"	antiquata	.. ..	Baird.
"	jonesii	.. ..	Baird.
"	acerosa	.. ..	Brady.
Eucythere	parva	.. ..	Brady.
Loxoconcha	impressa	.. ..	Baird.
"	guttata	.. ..	Norman.
"	tamapindus	..	Jones.
Xestoleberis	aurantia	.. ..	Baird.
Cytherura	angulata	.. ..	Brady.
"	cuneata	.. ..	Brady.

Cytherura	striata	..	..	<i>Sars.</i>
„	similes	..	..	<i>Sars.</i>
„	acuticostata	..		<i>Sars.</i>
Cytheropteron	punctatum	..		<i>Brady.</i>
„	nodosum	..		<i>Brady.</i>
„	multiforum	..		<i>Norman.</i>
„	subcrinatum	..		<i>Sars.</i>
Bathocythere	constricta	..		<i>Sars.</i>
„	turgida	..		<i>Sars.</i>
Pseudocythere	caudata	..		<i>Sars.</i>
Sclerochilus	contortus	..		<i>Norman.</i>
Paradoxostoma	ensiforme	..		<i>Brady.</i>
„	abbreviatum	..		<i>Sars.</i>
Polycoppe	compressa	..		<i>Brady.</i>

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 ADDENDA.

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 MAMMALIA.

*Martes foina*—The Marten Weasel, or Marten Cat.—This has been recently shot near Delabole.

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 AVES.

*Crex Minuta*—The Little Crane.—This has lately been shot in the Parish of St. Dominick.

